

SCIENCE, PROFESSIONALISM AND THE DEVELOPMENT OF
MEDICAL EDUCATION IN ENGLAND: AN HISTORICAL SOCIOLOGY.

by

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DECLARATION

I hereby declare that this thesis has been researched,
composed and written by myself.

ABSTRACT

Education lies at the very epicentre of professional formation, professional behaviour, and professional values. Far-reaching institutional and curricular changes occurred in the education of doctors in the nineteenth century. These changes were related, I argue, to two long-term historical processes - the 'professionalisation' and the 'scientification' of medicine. England is the main geographical focus, but the thesis also encompasses a brief comparative historical sociology of the emergence of 'hospital' and 'laboratory' medical education in France and Germany respectively.

Doctors were the first occupational community to claim that their 'professional' status rested on the sure foundation of 'scientific' knowledge and expertise; but the thesis adopts an attitude of anthropological scepticism towards both the alleged cognitive supremacy of 'scientific' medicine and its assumed role in conferring 'professional' privileges.

Nevertheless, the rhetorical appeal of scientific culture proved strategically useful to doctors in their collective pursuit of upward social mobility in three particular contexts: the efforts of rank-and-file practitioners to usurp the professional privileges of elite consultants; regular doctors' attempts to eliminate professionally damaging competition from a variety of alternative and irregular healers conventionally labelled as 'quacks'; and the emergent relationship being forged between the medical profession and the modern state.

A finely-textured analysis of intra-professional conflict is necessary to account for the politics of medical reform and for prolonged disputation over the future direction of medical education. There were two principal axes of internal conflict between medical interest-groups: the first between general practitioners and consultants; the second between traditional clinicians, many of whom actively opposed the introduction of experimental procedures into medical education, and those who vigorously promoted progressive scientific reform. The latter conflict, which has often been underestimated, is characterised in terms of a structural opposition between the scientific 'word' and the clinical 'ward'. Such an explanatory framework offers the historian a more valuable resource than the simple antithesis between 'empiricism' and 'rationalism'.

At the end of the Victorian period, apprenticeship had been eliminated and all aspiring doctors were educated in a university. It was through education that doctors were imbued with a set of professional value-orientations, and forged feelings of common identity and solidarity. The instance of Victorian doctors suggests that the historic role of the professions in English society is far less marginal and peripheral than has often been supposed.

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LIST OF ABBREVIATIONS

BA: Bachelor of Arts.

BMA: British Medical Association.

FRS: Fellow of the Royal Society.

GMC: General Medical Council.

GPA: General Pharmaceutical Association.

KCL: King's College, London.

LSA: Licentiate of the Society of Apothecaries.

MB: Bachelor of Medicine.

MD: Doctor of Medicine.

MP: Member of Parliament.

MRCS: Member of the Royal College of Surgeons.

PMSA: Provincial Medical and Surgical Association.

RCP: Royal College of Physicians.

RCS: Royal College of Surgeons.

SCME: Select Committee on Medical Education.

SCMER: Select Committee on Medical Education and
Registration.

UCL: University College, London.

WSA: Worshipful Society of Apothecaries.

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INTRODUCTION

This thesis comprises an examination of important themes in English medical education with particular attention to the early and mid-nineteenth century, though with some discussion of earlier and later developments, and brief comparative excursions to France and Germany. The thesis is conceived from an explicitly sociological standpoint and draws on the explanatory concepts and categories of the social sciences in the conviction that frequently alluded to epistemological demarcations between history and sociology as academic disciplines need to be transcended. Heuristic frameworks which provide the historian with interpretative resources with which to enrich the study of the past are adopted in preference to the narrative reconstruction of 'events' and psychological investigation of 'individual' personalities that has often passed for history.(1) The thesis nevertheless does draw upon some primary sources, principally but not exclusively, in the form of medical teachers' prolegomena to their annual courses of lectures.

How does an historical sociology differ from a conventional history of medical education? To some extent, the subject matter of the historical development of medical education will confront any scholar with critical core questions which will, in part, dictate a common focus of investigation. For example, any historical study concerned with this field of enquiry would entail examination of the institutional milieux in

which medical education was conducted; of the organisational basis of medical schools; of the student's changing curriculum; and of the disproportionate influence of innovative teachers. Other relevant aspects of a scholarly investigation into the evolution of medical education immediately suggest themselves: the origins of the medical school; its involvement with licensure arrangements; the social backgrounds of medical students; the impact of new knowledge and technology; the developing relationship between the school and its clinical facilities; and the decision-making procedures operative within the school.(2)

The present study certainly seeks to advance our knowledge of such dimensions of medical training, and also includes discussion of external contingencies such as the activities of grave-robbers; the ravages of epidemic diseases; and the existence of a powerful anti-vivisection movement; - all of which played an important part in the history of medical education in the nineteenth century. However, many conventional histories have often been vitiated by a narrow focus on the principal personalities of the relevant school; a preoccupation with detail to the detriment of significance; an implicit methodological internalism; and a hagiographical intent, frequently calculated to confer retrospective prestige on the institutions and historical actors under discussion.(3)

This thesis seeks to avoid the intellectual shallowness of such orthodox histories by adopting a systematic sociological focus upon those two long-term historical processes which have long obsessed medical historians: the development of medicine as a 'profession', and the emergence of 'scientific' medicine, both of which have customarily been identified as the accomplishment of the Victorian doctor. Continuity throughout the thesis is provided by the attempt to explain how particular changes - both institutional and curricular - in the sphere of medical education contributed to the maturation of these ongoing socio-historical processes.

In attempting to describe and conceptualise the phenomenon of 'modern' medicine, many historians have implicitly construed the very definition of modernity in terms of medicine's dual status - on the one hand, as a system of knowledge which has reached maturity on the basis of 'scientific' mastery of illness and disease; and, on the other, as an equally mature practice resting upon sound 'professional' principles. One of the principal contentions of this thesis is that a range of unreflexive, uncritical and tendentious assumptions about both 'science' and 'professionalism' have impoverished the bulk of previous studies on the historical evolution of medical education in the modern period. According to these assumptions, largely the product of our Cartesian heritage, medical 'science'

constitutes an autonomous realm of representation, hermetically sealed and insulated from the wider social matrix in which 'professionalism' germinates.(4) Contra the premises of ontological dualism, the thesis seeks to establish the precise senses and circumstances in which it is legitimate to understand medical science and professionalism as somehow inter-related, mutually sustaining and reinforcing phenomena, i.e. to convey a sensitive appreciation of the symbiotic and dialectical relationship between these tangible historical processes.

This objective is accomplished, however, on different grounds from the 'standard view' or orthodox historiographical stance on this central problem of medical history - a view which holds that the relationship between science and professionalism is a straightforward one of cause and effect. The evolution of the profession of medicine towards the end of the nineteenth century emerged, in this conception, as a direct, unmediated product of the scientific revolution in Victorian medicine. Ex hypothesi, the array of scientific and technological achievements - vaccination, anaesthesia, asepsis, bacteriology, the stethoscope, the ophthalmoscope and the microscope - customarily identified with that revolution, conferred upon Victorian doctors diagnostic and therapeutic capabilities which ineluctably bestowed and fully justified the status, prestige and remuneration of a

gentlemanly profession.(5)

Some medical historians, however, have recently proffered a 'revisionist' historiographical position which seriously calls into question the direct causal connections posited in the standard view between scientific expertise and professional status. The revisionists legitimately criticise whiggish, positivist and ahistorical approaches which simplistically represent the advent of scientific medicine as coextensive with the emergence of bacteriology and germ theory, which purportedly embodied efficacious therapeutic modalities thereby vindicating the 'truly scientific' character of bio-medical innovation. Against this circular and solipsistic argument, the revisionist position counterposes a more historically sensitive, methodologically agnostic and anthropologically sceptical understanding of the phenomenon of 'scientific' medicine: it entails adopting a more 'symmetrical' approach towards knowledge-claims, and a refusal to accord any epistemological privilege or singularity to the 'scientific' claims of doctors.(6)

This alternative outlook demands a non-judgemental attitude towards 'quacks' and 'quackery', which suspends for the purposes of analysis (rather like the phenomenologists' 'bracketing of the epoche') the highly pejorative connotations of those very terms. Historical enquiry might establish that verbal utterances about 'quacks' might be so integrally bound up with their

context of use and the particularistic goals and interests of the historical actors who articulate them, that these terms cannot properly stand as self-evident as to their meaning.(7)

Similarly, the revisionist position entails a relativistic attitude to the customary 'betes noires' of the positivist medical historian - those notoriously 'primitive' therapeutic practices of bleeding, purging, blistering, sweating and the administration of emetics. It proposes the explanatory advantages of more insistent historicity: such 'invalid' therapeutic modalities did some kind of therapeutic work if understood, in the fullest sense, in relation to the historical circumstances in which they were administered.

Congruent with this more relaxed, relativistic attitude towards the cognitive status of various forms of knowledge, scholars have also cast doubts upon the methodological propriety of seeking to delineate objective traits or characteristics of those occupations collectively known as 'the professions'. There have been attempts to specify objective criteria according to which different occupational collectivities might be compared in terms of their correspondence to an 'ideal-type' of the 'professional' occupation as such; but it is increasingly recognised that such attempts run the risk of reproducing the static, ahistorical assumptions of discredited 'trait' and 'functionalist' sociological models of professionalism.(8)

The revisionist perspective on the professions also adopts a 'symmetrical' approach towards all occupations and rejects the thesis, associated particularly with Merton(9), that professions based (like medicine) on science demand 'exceptional' modes of sociological explanation on account of the special, epistemologically privileged character of the knowledge-base on which their collective practice supposedly rests.

The claim to professional status has been put forward by incumbents of a wide variety of occupational roles and is, in principle, available to members of all occupational groups in pursuit of upward collective social mobility.(10) 'Professional' status is not necessarily a 'natural' reflection (as professionals themselves have frequently maintained) of superior knowledge or technical expertise, of 'ethicality', or of a 'disinterested' concern to promote the 'collective interest' or advance the 'common weal', for it may rather be the outcome of a series of complex, historically specific political struggles over the distribution of power and wealth in a given social formation.(11) Reflexive awareness that those who have most commonly written about the history of the professions have seen themselves as 'professionals' is necessary to avoid a critically distorted history of the Victorian medical profession which both accepts doctors' self-evaluations at their prima facie value, and is insensitive to the ideological uses of the past.

Thus the present study is sympathetic to the anti-objectivist thrust of the revisionist historiographical critique of the notions of medical 'science' and 'professionalism' as applied to the modern period. Yet it differs from that critique in seeking to re-establish some sense of a causal inter-connection between the two processes by focussing upon the social and cultural milieux in which they found concrete expression. The thesis examines various rhetorical strategies developed by different medical interest-groups and identifies three analytically separable contexts in which the burgeoning cultural cachet and social utility of 'science' was espoused in furtherance of professional objectives. In all of these contexts it was self-conscious appeal to the rhetoric rather than the 'cognitive' esoteric content of science that proved historically decisive.(12)

In the first context, the rhetoric of science - an increasingly important ingredient in the staple diet of Victorian middle-class discourse(13) - was articulated by general practitioners in their belligerent campaigns to transform their marginal status and usurp some of the long-standing monopolistic privileges jealously guarded by the medical elite.(14) Because it was directed against such invidious and deeply resented iniquities, general practitioners' political activities possessed a genuinely radical anti-monopolistic dimension which has often been underestimated.(15)

In the second context, scientific medicine was invoked by regular practitioners in their determined efforts to quell the competition of a host of irregular healers, whose existence was recognised as inimical to the campaign to secure a favourable market for professional services. Restriction of access to medical education meant that only the regular doctor, schooled in the esoteric mysteries of scientific medicine, could legitimately engage in medical practice. In contrast to the previous instance, the logic of this strategy did ultimately point to monopolisation.(16)

In the third context, scientific knowledge - especially physiology, social hygiene and 'sanitary science' - opened for Victorian medical men a privileged conduit to successive governments, betokening a growing reciprocity between the interests of the medical profession and the administrative imperatives of the modern state. Paradoxically, in the long term, doctors surrendered a degree of autonomy to a relatively autonomous state, yet state mediation was precisely the factor which preserved and maintained professional autonomy for medical practitioners.(17)

Fully attune to the revisionist critique of both the myopic vision of science as a linear series of truths progressing ever closer to an objective explanation of a fixed 'Nature', and the equally misleading view of a profession as a privileged occupational community whose special identity and disproportionate share of the

wealth, status and resources available to a given social formation is a simple reflection of its disinterested performance of functionally necessary tasks in response to (untheorised) social 'needs', the thesis nevertheless falls short of unequivocal endorsement of the revisionist position in the insistence that three contexts did exist in which coincidence between scientific innovation and professional aspiration is identifiable in the discourse and action of Victorian doctors.(18)

Only if 'the medical profession' is disaggregated into different segments is an accurate understanding of how medical knowledge was put to the use of social purposes in particular contexts likely to be advanced. General practitioner groups had far greater cause (in the absence of any demonstrable therapeutic efficacy of their 'scientific' product) to espouse the rhetoric of science as a vehicle for securing professional status than the consultant elite, long disposed to legitimise its privileges with reference to gentlemanly demeanour, aristocratic culture, breadth of erudition, good character and other such primarily 'non-medical' values.(19)

Moreover, one extremely important and powerful interest-group within the Victorian republic of medicine represented a significant countervailing force in the historical development of scientific medicine - those members of the clinical community socialised in the

autochthonous traditions of medical culture who proved profoundly suspicious and resistant to the progressive incursions of experimental medicine and laboratory science even at the end of the Victorian period. An examination of the pedagogical discourse delivered in English medical schools forms the basis for the elaboration of the other cardinal theme of the thesis - the long-term importance of cultural antagonism and contradiction between 'scientific' and 'clinical' medicine.

This duality in the development of medical education is characterised in terms of a structural opposition between the poles of the scientific 'word' and the clinical 'ward'. Such a framework is not intended to demonstrate any simple, clear-cut distinction between the different cultural constellations, but to suggest a more analytically sensitive and historically accurate means of grasping the evident contradictions in the germination of medical culture than is possible on the basis of a straightforward antithesis between 'empiricism' and 'rationalism'.(20)

Throughout the period of this study, medical education was an arena of conflict. The individual disciplines on the medical curriculum were in the fullest sense "creatures of history"(21) in highly complex flux; medical teachers proved adept at articulating educational ideologies with which to justify their continued existence. Certain subjects,

like botany, zoology and materia medica (which were the object of the obloquy in respect of medical education of powerful spokesmen such as T.H.Huxley) emerged as historical losers in the competition for curricular space. Others, notably physiology, (for Huxley "the experimental science 'par excellence'")(22) emerged triumphant. Curricular disputes were the inevitable product of the vast expansion of medical knowledge and the proliferation of specialisms in the later Victorian period. However, socially-structured tensions between partisans of the scientific 'word' and the clinical 'ward' are accorded greater cultural prominence than disputes between comparative anatomists, histologists and experimental physiologists. The latter are effectively subsumed by the former, but it is always a matter for empirical investigation to determine whether a specific medical discipline is identifiable as 'clinical' or 'scientific' in a particular historical period.

The three different contexts in which doctors sought to coalesce for professional purposes around a configuration of 'scientific' knowledge, and the different bases of intra-professional conflict over the future direction of medical education are the major themes of the thesis. Other sub-themes emerge in the course of expounding the main arguments. The thesis consists of eight chapters whose subject-matter is outlined below.

The first chapter is devoted to theoretical considerations. Since all explanation ('scientific' or otherwise) is inevitably theory-laden(23), historical enquiry cannot properly be conceived in purely empirical, atheoretical terms. Three particular historiographical issues are considered: the relationship between history and the social sciences; the historiography of science and medicine; and the implications of the 'oeuvre' of Michel Foucault and other 'quasi-structuralists' for the historiography of medicine with particular reference to medical education.

Chapter two is mainly prefatory in conception: it examines the education of doctors in the eighteenth century, commonly referred to as the period of the 'adolescence'(24) of modern medicine. It focusses on that commonplace of medical history - the tripartite legal and hierarchical structure of the medical profession, which decreed that medical practitioners were to be educated as physicians, surgeons or apothecaries. More accurately, it focusses on its disintegration, for the disordered state of medical education was a reflection of the breakdown, at the level of social action, of the formal professional structure. In long-term historical perspective, the tripartite order was evolving into a bipartite professional structure based upon divisions between general practitioners engaging in all the branches of medicine, and a consultant elite comprising university-

educated physicians and leading surgeons. Much of the dynamism in medical politics for about one and a half centuries after 1700 is seen to stem from the basic problem of how to integrate a qualitatively new kind of practitioner into an established legal and institutional structure which could not, without fundamental change, accommodate him.(25)

Chapters three and four together comprise an attempt at a systematic historical sociology of the English medical reform movement between 1815 and 1858. Wide-ranging disputes over many facets of medical education - costs, the curriculum, the social origins of neophytes, its relation to the medical corporations, its availability, its mismanagement by an aloof and disinterested elite - were a critical element of the medical politics of this period. The causes and consequences of medical legislation - the Apothecaries Act of 1815, the Anatomy Act of 1832 and the Medical Act of 1858 - are examined from a sociological standpoint in relation to the competing interests of different fragments of the wider profession. The bulk of these two chapters is given to detailed elaboration of those three contexts in which Victorian medical men clearly drew upon the rhetorical resources of science in support of a variety of 'professional' goals.

Chapters five and six together discuss medical education at the English universities, principally during the first half of the nineteenth century. The

cardinal theme is the relationship between institutional contexts, medical knowledge and professionalisation, but the complexity of the history of the universities precludes identification of any clear-cut or unambiguously defined relationship. Even the two ancient universities of Oxford and Cambridge - for all their prima facie homogeneity in respect of social purpose, cultural function, intellectual ethos, religious exclusiveness and elitist orientation(26) - must be examined separately in order to understand the character of the medical education conducted under their respective ivory towers. Collegiate institutional organisation acted to some extent as a bottleneck which obtruded the efforts of both universities' scientific reformers; but Cambridge rather than Oxford, in the last analysis, proved the more fertile academic environment for the cultivation of scientific medical education.(27)

The historical development of medical training in the two university colleges established in London in the late 1820s also suggests a series of contrasts as well as some superficial similarities. As with the universities of Oxford and Cambridge, the religious ethos of these fledgling metropolitan institutions profoundly influenced the academic environment and, in turn, even the style of the medical pedagogy and scientific innovations introduced into their medical schools. University College, London housed many political radicals and religious nonconformists; King's

College, in contrast, was a politically conservative and theologically orthodox institution brought into existence as an Anglican counterblast to the 'godless' infidelity of its rival. Chapter six seeks to demonstrate that there was nothing 'exceptional' about the 'scientific' character of the education of doctors provided at either of these metropolitan colleges which removed it from the sphere of political and religious controversy.

At the end of our period, all prospective doctors underwent common socialisation at a university, irrespective of their intended career specialisms. The proliferation of provincial institutions of higher education in the second half of the nineteenth century is not discussed in this thesis, (on this subject, see the important thesis of Stella Butler(28)), but the development of England's universities was a critical element of the professionalisation of medicine. The social significance of the university is underlined: members of the medical and surgical elite were acutely aware, and frequently declared, that the cultural cachet of university education was essential to the advancement of the social interests of the medical profession.

Chapters seven and eight are also closely linked. They provide detailed demonstration of a deeply divided Victorian medical culture, revealing how medical education was the object of profound controversy and antagonism between rival groups of teachers. Pedagogical

discourse is shown to serve contrasting polemical purposes: on the one hand, to legitimise the value for practical medicine of experimental methods, naturalistic physiological science, vivisection and the laboratory; and, on the other, to denigrate the same as irrelevant or even counter-productive and dangerous for therapeutics in the insistence that only long-established, autonomous clinical methods of diagnosis and therapy could be relied upon for the 'real' medical encounters of the hospital ward.(29)

Because hospital and laboratory medicine originated in France and Germany respectively, chapters seven and eight commence with a brief comparative historical sociology of medical education in those nation-states. Congruent with recent macroscopic and interdisciplinary interest in large-scale variations in educational systems, professional institutions, scientific and medical establishments and other related social phenomena, this kind of comparative analysis opens up an avenue for the exploration of the complex social, economic and political dynamics which underlie the range and variation in the content, quality and organisation of medical education in different societies. The degree of political intervention of the nineteenth century state in the affairs of the medical profession(30) (or the degree of autonomy reserved for the profession) and the character of each society's educational system (particularly the degree of integration between its

primary, secondary and tertiary sectors) accounts for much of the flux in the international pre-eminence of a nation-state's medical schools.

The conclusion draws together the threads of the thesis, summarises the main arguments and offers some general reflections on the historic project of the professionalisation of modern medicine in the context of English society. Only towards the end of the nineteenth century did Victorian doctors become a fully autonomous and self-regulating profession, largely a consequence of their successful attempt to wrest power from lay governors who had long administered and controlled the day-to-day operation of hospital activities.(31) The problematic implications of this well-known argument for recent interpretations which hold professionalisation to be a phenomenon of an earlier period in English history are discussed.(32)

Taking Perkin's observations on the relative weakness of professional groups in English society as a point of departure(33), the history of Victorian medicine is adduced in support of the proposition that the ideology of 'service' facilitated the efforts of professionals to gain a degree of cohesion and social power greater than conventionally supposed.(34) The central paradox of the professions is specified and found to be relevant to the occupational circumstances of Victorian doctors. This paradox is the fact that the professions cannot with justice be explained as a simple, direct product of the

market-centred capitalist society of the nineteenth century, yet nevertheless were not immune from its pervasive influence: they embraced both bourgeois and anti-bourgeois values.

Finally, this introduction terminates with two qualifications. First, whilst insisting upon the value of explicit frameworks - heuristic or substantive - for writing medical history, this thesis is not an attempt to force or distort the rich texture of the past into pre-defined a priori categories. It is not argued, for example, that every significant development in medical education contributes to an ever-creeping professionalism: indeed, such whiggish connotations are eschewed in the contention that certain episodes - like the passage of the Apothecaries Act in 1815 - hindered rather than promoted the mature emergence of a profession of medicine.

Secondly, whilst emphasising the potentially illuminating way in which the insights of the sociology of knowledge can be brought into fruitful articulation with historical accounts of the shaping of scientific and medical culture, it is no part of the argument of this thesis that social interests - whether understood in relation to the 'internal' social organisation of scientific or medical specialties, disciplines or research schools, or in terms of wider 'external' collectivities or classes - must necessarily in all circumstances and periods shape, influence or

determine the predominant style, idiom or esoteric content of scientific medicine.(35)

These are contingent matters, and the extent to which social interests mutually interacted with the 'cognitive' content of medical knowledge can only be determined on the basis of evidence relating to the specific context in which that knowledge was deployed. It is suggested, however, that in attempting to explicate the genesis of change and development in medical education and culture, no interests - social as much as technical - ought to be excluded from consideration a priori.(36)

CHAPTER ONE

HISTORY, SOCIOLOGY AND MEDICAL EDUCATION: AN OVERVIEW.

Social History or Historical Sociology?

"<T>he problem of explanation in history is also the problem of the nature of sociology." Ernest Gellner.(1)

"Any classification is superior to chaos." Claude Levi-Strauss.(2)

"<History> and Sociology have long lived under a segregated system which has succeeded in concealing their rivalry only by refusing them any meeting ground, impeding their growth, making them incomprehensible to one another, and thus placing culture in a situation of permanent crisis." Merlau-Ponty.(3)

This thesis is primarily a treatise in the social history or historical sociology of medical education from the eighteenth to the beginning of the present century. In as much as it embraces what are often tendentiously regarded as epistemologically distinct disciplines (history and sociology), it is appropriate to commence with discussion of their proper relationship. The erection of methodological and epistemological barriers, whilst serving to create, maintain and perpetuate intra-professional autonomy, has obscured the ineradicable commonality of historians' and sociologists' intellectual project. Procrustean methodological prescriptions and prohibitions, as Feyerabend has forcefully argued, have often proved to be "the enemy of truth."(4) The present thesis is written in the spirit of E.H.Carr's oft-cited contention that "the more historical sociology becomes and the more sociological history becomes the better for both."(5)

Arraigned against this synthetic and symbiotic vision is a complex of forces which has seen fit to sustain clearly-drawn demarcations between the disciplines by means of a strategy of academic or cultural apartheid. At the core of this strategy is the attempt to furnish intellectual rationalisations for the intuitive perception of history as a discipline concerned with the 'unique', the 'particular' and the 'concrete' as opposed to sociology's preoccupation with the 'uniform', the 'general' and the 'abstract'. Elton's neo-Kantian distinction between the 'idiographic' and the 'nomothetic' has been the most frequently deployed intellectual resource in the project of defending the strict autonomy of history against the encroachments and incursions of sociological 'theorising'.(6) Professional historians' conception of the subject matter of history as simply rendering inoperative, or 'falsifying' - in somewhat crude Popperian fashion on the basis of empirical evidence - the theoretical models or schemata purportedly elaborated by sociologists, merely gives added credence to Peter Burke's observation that communication between the rival academic communities has frequently resembled "a dialogue of the deaf."(7)

Opposition to the project of rescinding the barriers which have dampened and obscured the sense of relatedness between history and sociology has crystallised around three major propositions. First, some historians have argued for the inherent autonomy of

history on the basis of an appeal to the rhetorical mystery of 'narrative' as an intellectual exercise peculiar to the craft of the historian. Second, the claim to autonomy has rested on the specificity of historical 'events'. Third, professional historians have confronted advocates of disciplinary symbiosis with the charge that sociological reconstructions of the past have failed to demonstrate the disproportionate impact of exceptional 'individual' actors on the drama of the historical stage.(8)

None of these contentions withstands careful analytical scrutiny. First, historical narratives are woven into a matrix of assumptions - about causation, sequential ordering, structuration, time-space relations, mutual interaction between individual actors and larger structural collectivities - that are concealed, not transcended, by unreflexive historical practice. Autonomous or not, it is contended here that narrative is inadequate to history's task of explanation based upon a dialectic of theory and evidence. Beyond narrative, history turns to analysis, indistinguishable in construction and operation from that embodied in sociological accounts of cumulative causation.

Second, the importance attached by some historians to unique, situated, historically specific 'events' in the explanation of social change no more represents a barrier to interdisciplinary synthesis than does narrative. Differences between the academic communities

over the historiographical significance of 'events' have been most conspicuous in debates over the genesis of class societies.(9)

Historians have insisted that the birth of class was an emergent happening, an inherently fluid relationship reflected in a complex of events rather than a reified construct to be comprehended as a structural phenomenon rooted in a determinate historical mode of production.(10) The specific diversity of a myriad of events must indeed be grasped in complex, empirical detail, but may without explanatory injustice be located structurally within a wider context and broader conception of the dynamics underlying social and historical change. Conceding that sociologists may have under-rated their significance, 'events' present the sociologist no less than the historian with "an indispensable prism through which social structure and process may be seen."(11)

Third, a separate, distinctive identity for history has also been projected on the basis of an attempt to ontologise the atomistic and individualistic assumptions deeply woven into the fabric of Judaeo-Christian culture. Opponents of historical sociology have contended that the life-histories of exceptional individuals are inconsistent with, and elude the grasp of, structural modes of explanation favoured by proponents of the sociology of knowledge. The conception of the 'abstract individual' as an entity separate from,

external to, and living in an unmediated relationship with, 'society' owes its historical origin to liberal social contract theory of the seventeenth century, and has obscured how individuals and their societies are at once aspects of a unified human reality.(12)

'Exceptional' individuals - T.H.Huxley and H.W.Acland, for example - undoubtedly exerted a disproportionate impact on Victorian medical education, accomplishing far-reaching transformations of its content and practice. Discussion of their 'charismatic' influence is not, however, inconsistent with the premises of historical sociology; for it is conducted on the supposition that all that is 'exceptional' about the lives of such 'exceptional' individuals is their location in a particular historically organised milieu in which individuation is accomplished through the interactional patterning of a series of experiences. In Karl Mannheim's apposite contention,

"<t>o recognise that the individual is the focus of reality is not the same as to construe the self as an isolated entity: to understand his behaviour one has to know the constellation in which he acts."(13)

Recent scholarly discussion of the methodological propriety of individualistic as opposed to structural modes of explanation has centred on the interpretive problems encountered by the historian in attempting to unravel the meaning of texts, and the circumstances in which textual statements may be related to their historical contexts of production. Quentin Skinner's

methodological strictures concerning the study of political thought are well-known; but since all knowledge stands symmetrically from the perspective of the sociology of knowledge, the following critique of Skinner's prescriptions for understanding political texts stands unreservedly as criticism of equivalent methodology espoused by historians of medical knowledge and thought.

Skinner's and other revisionists'(14) major complaint consists in the charge of a flagrant lack of historicity in scholarly efforts to comprehend the linguistic artefacts of the past. Skinner's 'bete noire' is the prevalent notion that the purpose and value of studying classical texts is to extract timeless, immortal truths whose wisdom may then legitimately be applied to the controversial political issues of the present. Skinner correctly argues that analysis restricted to purely hermeneutic considerations leads to historical absurdity. Textual study alone has induced distorted historical practice through implicitly basing their explanations on a series of 'mythologies' - of 'coherence', of 'doctrine', of 'prolepsis' - which has impoverished much exegesis in the history of ideas.

The remedy for this pathological species of historical practice lies in the infusion of more historicity - in recognition that any textual statement is 'bounded' by historical time, a product of a particular occasion, addressed to the solution of a

particular problem and therefore specific to its situation in a way that cannot, without naivety, be transcended. Meticulous attention to the specific ideological context of a given text rather than abstract philosophical reflection on its content is, for Skinner, the more legitimate methodological standpoint for the historian to adopt.

The revisionists, however, confront not only the hermeneuticists' idea that the autonomy of a text is the sole key to its own meaning, but also the strategy of 'contextualist methodology'. Whilst it might appear from the above that the historian may validly present the ideas of our historical predecessors as forever locked into their determinate contexts, the revisionist school do not defend any form of determinism which seeks to reduce textual statements to an underlying more 'real' world of production or social reality. On the contrary, the revisionists are almost infatuated with what Husserl termed 'the intentionality of experience'.

Drawing upon some of the tenuous assumptions of Oxford philosophy of action, Skinner attempts to assimilate textual utterances with communicative action to demonstrate that cultural products may be referred only to the complex 'intention' of the author in question. Contextualist methodology, for Skinner, errs in conflating the causes of an action or utterance with its 'point', which cannot be established in isolation or abstraction from the mens auctoris. Neither the text

itself, serenely communicating with the solitary reader, nor detailed cognisance of the historical context in which it was written permit the historian to capture that 'intended illocutionary force' necessary to understand, in the fullest sense, the text's meaning.(15)

The revisionist historians of ideas consequently appear to prohibit the historian of medicine from adopting a standpoint which might grasp the meaning of medical texts or discourses as mutually constitutive with a context comprising a complex nexus of religious, political and economic factors. Pace Skinner, however, it is contended here that a quasi-theological fixation on the elusive phenomenon of human intentionality, in Femia's words, "can only impoverish our approach to the history of ideas, diminishing our capacity to learn from our forebears ..."(16) Unearthing the historical meaning of communicative action is not equivalent to discovering its 'intended illocutionary force', for this is to circumscribe unnecessarily the variety of analytical frameworks potentially available to the historian, and to deflect attention from the importance of assessing the definitive impact (at various levels) of the communicative action in question.

What an author is doing in composing a treatise in science or medicine cannot be understood solely, or even mainly, in terms of his intention 'in' doing it (insofar as this can plausibly be reconstructed).(17) Given the

diversity of contingencies that underlie intentionality, it can never be comprehended as a simple or unambiguous phenomenon.(18) Intentionality may not be unified; and where intentions may be uncertain, or even radically ambivalent, it is difficult to conceive how revisionist methodology supplies the historian with more serviceable resources than those proffered by more thoroughgoing contextualists committed to a complex, (non-reductionist) species of historical epiphenomenalism. The latter rather than the former provide the historian and sociologist with the rudiments of an intellectual strategy for accomplishing their ultimate explanatory goal - some mode of 'squaring' the hermeneutic circle. Revisionist methodological strictures do nothing to undermine the rationale for the present project of an historical sociology of medical education.

Attempts to perpetuate distinctive, autonomous identities for history and sociology have been subjected to critique without yet delineating where the essential commonality of the disciplines resides. It is widely acknowledged that the central dichotomy in contemporary social theory revolves around the distinction between 'action' and 'structure'. This dichotomy is reflected in 'two Marxisms'(19) (of 'critique' and 'science') and underpins a wider bifurcation across the whole range of the human sciences. The resolution of entrenched ontological dualisms is the key to the common identity

of history and the social sciences. Historical sociology subjects to critique those pervasive antinomies of synchrony and diachrony; action and structure; consciousness and being; individual and society. Abrams, in a sensitive and germinal study, has demonstrated how both disciplines "seek to understand the puzzle of human agency and both seek to do so in terms of the process of social structuring." (20)

In this light, the principal objections to the intellectual unity of history and the social sciences disintegrate. Hence, 'narrative' history records change through time accomplished by historical actors who at once reflect and transform the social structure in which they act; 'events' constitute the principal points of access to the structuring of social action through time; and 'individuals' are intelligible within a framework which comprehends the historical unity of personal identities accomplished through action, and social configurations representing the wider structural matrix. In short, as Abrams concludes,

"<t>he project of historical sociology involves us in superimposing structure on history with a view to recovering the way history superimposes structure on us. It crystallises as a negotiation of concept and evidence in the concrete study of structuring." (21)

It follows from this position that the conventional debate on history vis-a-vis sociology has been fundamentally misconceived. For it is mistaken to discuss the 'relationship between' the disciplines since

they are and always have been common aspects of a unified intellectual enterprise.

The historiographical standpoint adopted in the thesis entails no claim to 'completeness' on the basis of egregious illusions about historical documentation. Historical sociology does not rest on the transference of positivistic epistemology from sociology to history. Given the inherently infinite complexity of any historical period, the historian can do no more than attempt to 'make sense' of the rich texture of the past in a particular way, drawing - selectively(22) - from evidence. Indispensable to this necessary hermeneutic of 'making sense' are explicit frameworks - intellectual resources which potentially enable the historian to transcend what Morrell has termed the "myopic, piecemeal empiricism"(23) still frequently encountered in the history of science and medicine.

The foregoing discussion of the status of history vis-a-vis the social sciences, and of the methodology appropriate to the study of the history of (medical) ideas has been intended to establish the meaninglessness of any differentiation between a social history or historical sociology of medical education. It leads ineluctably to agreement with Giddens' contention that "with the recovery of temporality as integral to social theory: history and sociology become methodologically indistinguishable."(24) To argue otherwise would be to confuse logical explanation with the pregnant rhetoric

of academic interests.

Some professional historians and sociologists have suggested that the problem of the relationship between history and the social sciences is reducible, in the last analysis, to a question of balance - between experience and abstraction; between description and analysis; between the Scylla of an overly structuralist theoreticism which represses the historical dimension of social theory itself, and the Charybdis of an overly atomistic and empiricist orientation which denies theory any role whatever in recovering the meaning of historical processes. Both communities might be presumed to concur on one proposition at least - that such problems of balance will only be resolved through self-conscious historical/sociological praxis.

The Historiography of Scientific Medicine.

"<T>he best medical history is to some degree always a historical sociology of medical knowledge." Charles E. Rosenberg. (25)

Iatrocetric images of medical science are currently under attack. The tendency towards a more critical stance vis-a-vis the distinctive characteristics of medicine as a system of knowledge has emerged only as recently as from the 1970s. This decade witnessed the proliferation of a range of new analytical perspectives and explanatory paradigms by which science and medicine might be comprehended, not as epistemologically privileged forms of knowledge hermetically sealed from any influences other than the purely 'logical', but in

relation to the historically specific social and cultural settings in which they are embedded.

In recent years, the historiography of science and medicine has undergone what Rousseau and Porter have legitimately termed a "revolution"(26), largely inspired by developments in sociology and anthropology, and consolidated by increasing awareness of the applicability to history of broader currents of thought such as Marxism and structuralism. This historiographical revolution poses profound implications for the social history of medical education in the nineteenth century.

Earlier iatrocetric histories were characterised by the assimilation of the values of the investigator into the dominant ethos and value-system of medical schools, medical science and the medical profession. Buttressed by related whiggish and positivist presuppositions, iatrocetricism exerted a pervasive influence on the practice of medical history, as reflected in the customarily narrow preoccupation with the 'scientific' advances of medicine, its technological innovations and the individual physician-scientists or 'great doctors' presumed to be responsible for such developments.(27)

It was during the nineteenth century that medicine acquired the pretence of kinship with the 'exact' sciences, culminating in Du Bois-Reymond's Procrustean pronouncement that the bio-medical sciences need not, and would not, acknowledge the operation of any forces

other than those of physics and chemistry. The overall impact of iatrocentrism has been to critically distort the historical accomplishment of scientific medicine through prima facie acceptance of post hoc scientific professional rationalisations, and through obfuscation of its underlying complex of technological, socio-economic and cultural forces.

Historians of medicine during the first half of the present century assiduously cultivated a sense of medicine's epistemological unity with the natural sciences. William Osler's "The Evolution of Modern Medicine"(28) was typical of this genre of medical history. It was written by a practising physician, who had become a powerful leader of the British medical profession, and eulogised the progressive scientific and professional achievements of modern medicine.

This side of the Atlantic, Charles Singer was perhaps most representative of the historiographical orientation towards positive identification of medicine with the sciences of nature. As Webster has suggested, the historiographical standpoint adopted by Singer "reflect<ed> the attitudes of the founders of the history of science and medicine in Britain, who saw the subjects having a close identity of purpose."(29)

The relationship between historians of natural science and those of medicine has not always been fraternal. In the 1930s George Sarton and Henry Sigerist respectively engaged in polemical debate. Sarton

complained that the history of medicine had been studied more intensively and systematically than the history of any other branch of the natural sciences. Sarton further charged that the bulk of studies in the history of medicine was of poor intellectual quality. His polemic culminated in the assertion that "the historian of medicine who imagine<d> that he <was> ipso facto a historian of science <was> labouring under a gross delusion."(30)

In response to Sarton's critique, Henry Sigerist retorted with a claim for the independent and autonomous identity of the history of medicine. Sigerist's long-term historiographical legacy is, however, problematic. In one sense he was instrumental in shifting the traditional centre of gravity of the history of medicine away from its iatrocetric parameters, because he insisted that if medicine had any genuine kinship with the sciences, it was with the social, not the physical, sciences. Medical history, in his conception, was intellectually arid and incoherent if presented in abstraction from the wider currents of economic, political and religious life in the stream of a society's historical evolution. His plea for a more engaged interest in the bearing of socio-medical change on the patient's experience of health and disease and his relationship with the doctor, (rather than the customary preoccupation with the intellectual equipment of leading physicians) constituted a radical indictment

of the historical practice of his day.(31)

In another sense, however, Sigerist's prescriptions for the future health of the history of medicine represented the apotheosis of iatrocentrism. Medical history, for Sigerist, was an integral component of the assemblage of ideas and practices comprising 'medicine'. He therefore urged that medical history should be written by historians who were also practising physicians in close touch with contemporary medical problems. As late as 1951 Sigerist was still defining a medical historian as

"a physician, trained in the research methods of history, who <took> an active part in the life of his time and <was> in close touch with the medical problems of his time."(32)

The ambivalence is evident: the hermeneutic insights to be gained by medical scientists writing the history of medical science were purchased at the expense of potentially paralysing the impulse towards the production of a kind of medical history fully sensitive to the notion expressed elsewhere by Sigerist himself - that diseases, the ideas of medical science and systems of medical care could not be divorced from the different societies which produced them.

The concentration of medical history in the hands of medical men - scientists, clinicians, practitioners - during the earlier decades of the present century spawned an unreflexive, parochial and iatrocentric historiography which shrouded medicine with an aura of

mystery, mystique and splendid autonomy. The history of medical ideas in this idiom was based on the presumption that physicians were engaged in the objective study of the nature of disease and that the medical historian ought therefore to study the cognitive powers of the mind of each individual physician. Much of the institutional history of medical schools or other corporate bodies (strictly demarcated from the intellectual in this historiographical tradition) clearly fell within the 'centennial' genre of laudatory and hortatory histories - typically brief surveys or chronological narratives lacking any critical framework or intellectual depth whatever.(33)

Paleopathological assumptions about the permanency and unchanging nature of disease imparted a static, ahistorical quality to such medical histories. Explanatory aporia was exacerbated by medical historians' implicit universalisation of the premises of the bacteriological revolution which reinforced the already-present inclination of clinicians towards ontological confoundedness and the reification of disease entities. Even if medical historians sided with alternative 'physiological' or 'functional' conception of disease, they sustained - albeit in a different idiom - the same assumptions as to the ahistoricity and asociality of disease phenomena. Diseases were presumed to constitute deranged physiological processes of an individual human being. Physiological disorders were

assumed to have a common, universal and invariant aetiological basis. Diseases, therefore, like the physics and chemistry on which physiology itself rested, were independent of time, place and circumstance. Neither ontological nor physiological explanations entailed any sense of disease as a fully socio-historical and cultural phenomenon, or of the way in which disease might mediate social relations in different historical periods.(34)

Yet the most conspicuous characteristic of this historiographical tradition was its obsession with the notion of medical progress. Ahistorical and asocial assumptions about disease aetiology were intimately related to the project of chronicling medicine's ineluctable advance into the 'modern', scientific and technological epoch. For if clinical syndromes on the one hand, or physiological and endocrine disorders on the other, were posited as perennial, invariant and immutable phenomena, then their 'conquest' by recent bio-medical advances provided a vantage point from which the gradual, but comforting and ultimately triumphal, emergence of scientific medicine from the dark ages of past might be documented.

Butterfield's famous 'truth' - "that there is a tendency for all history to veer over into whig history"(35) - is nowhere more apposite than in the context of the history of medicine, where the most significant episodes of the past appear only as an index

of progress towards the present intellectual condition of 'scientific' enlightenment. Furthermore, medical historians have often restricted their focus of investigation to those episodes deemed to have contributed most disproportionately to the present. The medical historian has examined Hunterian comparative anatomy, Listerian surgery, Darwinian evolutionary theory and Mendelian genetics, whereas alchemical or religious influences on medicine, homeopathy and a range of 'alternative' medical practices have been considered either unworthy of serious study or presented as 'obstacles' or 'impediments' to the onward scientific march away from superstition, ignorance, metaphysics and mere empiricism.

Whiggish predilections have also been manifest in medical historians' explicitly normative judgements upon what are presumed (in somewhat Hegelian fashion) to be dominant characteristics of a given medical epoch. Garrison, for example, eulogised the seventeenth century for its abundance of scientific achievements, but judged the eighteenth century "as dull and sober-sided as that of the Arabic period." (36) Normative judgmentalism at worst meant the historian reconstructing not the actual relationship that obtained between medical ideas and wider socio-political, religious and cultural facets of a given period, but rather the relationship that it was felt ought to have obtained on the basis of present-day Anglo-American philosophers' dictates on the nature of

'scientific' methodology and epistemology. The 'true' and universal meaning of medical science becomes purified through philosophical and conceptual analysis with the resulting pristine meaning providing a base-line for the retrospective examination of the 'failures' and 'misunderstandings' of past medical theorists and practitioners.

As intellectually stultifying as whiggism(37) is the related positivistic infatuation with the precise origins of the 'scientificity' of modern medicine. In conjunction with the equally habitual obsession with individual, commonly hagiographical, biography this positivist orientation has resulted in a prolonged, but ultimately meaningless, debate over the genealogical evolution of 'scientific' medicine.

'Great doctors' - for example, Harvey, Boerhaave, Morgagni, Haller, Hunter, Bernard, Virchow and Pasteur - have been identified, in turn, by venerating medical historians as the 'true' founders of scientific medicine. With either an ill-formulated or non-existent conception of the dynamics underlying scientific creativity and growth, medical historians of the older tradition sketched a portrait of medical knowledge as if received in pristine form from disembodied scientific intellectuals operating in a societal vacuum, and then constructed a range of mythologies around the individual medical scientists with whom each progressive advance to modernity and rationality is associated. The end result

was a history of medicine moving ever forwards to, and culminating with, verifiable 'scientific' knowledge and consequently deserved 'professional' status. Evidently, a degree of dyscrasia - a term employed in classical medicine to denote a faulty balance between the four humours - has infected medical history itself.

Underlying, and giving added credence to, this 'standard view' of medicine as universally applicable, value-free, objective knowledge of the nature of disease was a corpus of philosophical and epistemological postulates about 'scientific' knowledge more generally. Science was accordingly a uniquely privileged mode of cognition and form of culture resting on unshakeable foundations of rationality. The natural world was unquestionably real, and scientists ascertained its true character through detached, dispassionate and methodologically rigorous procedures. The adoption by the scientific community of stringent criteria of proof and verification ensured that collective practice remained insulated from the intrusions of 'subjective' (usually connoting economic, political or religious) biases. The factual foundation of scientific knowledge was guaranteed since its empirical claims conformed to the most demanding of the positivists' standards of evaluation. In short, the permanence of the physical world and the cumulative application by the scientific community of an objective, uniform methodology placed 'science' in an unassailable epistemological

fortress.(38)

Medicine too, as a corpus of scientific knowledge and practices was beyond the realm of mediation. The intellectual impact of tacit acceptance and endorsement on the part of medical historians of such epistemological verities in shaping a distinctive historiographical orientation has been demonstrated. Historians and philosophers were at one in grasping the core truth of inductivism: science was a continuously progressive phenomenon; present-day scientists knew objectively more than their historical predecessors; it was therefore incumbent upon the historian to reserve a privileged place for scientific rationality in accounting for medicine's historical development.

The range of perspectives potentially available to the medical historian for developing a specifically social approach was inevitably circumscribed by such epistemological prohibitions. Sociologically-inclined historians expressed interest in the scientific revolution between the fifteenth and the seventeenth centuries as a period which witnessed (in Ben-David's somewhat Rostovian terminology) a "take-off into accelerating growth." This complex historical phenomenon was explained as a product of "influential groups of economically and socially mobile people in different places in Europe who were in search of a cognitive structure consistent with their interests in a changing, pluralistic and future-oriented society."(39) Once

established, however, the cognitive or logical structure and the theoretical content of science were independent of the socio-historical contingencies impinging upon 'pre-scientific' knowledge. Its independence and autonomy, indeed, were constitutive of 'science' qua system of knowledge. For Ben-David, there could not, in principle, be a systematic explanation of the logical structure or content of modern science in terms of social, economic or political factors.

In examining the comparative development of physiology in the nineteenth century, the medical historian might evaluate the 'scientific productivity' (understood in quantitative terms as the number of recognised discoveries in physiological science) and relate the differential 'success' of different nation-states to 'social factors' such as organisational structure, institutional characteristics of tertiary educational systems, the investment of resources or the degree of 'competitiveness' in a society's value-system. The idea that different nations might nurture different styles of physiological knowledge, however, was anathema as this would contradict the noble view of medicine as the production of eternal truths about nature arrived at through the employment of a unique 'scientific' method. (40)

For Ben-David, 'society', 'culture' and 'interests' provided a context within which the historian might legitimately assess the constraints operating at

different periods on the activities of scientific communities; but they were utterly irrelevant to the significance and meaning of notions of truth and logical inference which governed those communities' scientific practices. The end-result of such academic products of the standard historiographical position was tacit intellectual endorsement and corroboration of the edicts of naively realist Anglo-American philosophers who construed science as, at bottom, "certain, indubitable and demonstrable knowledge"(41) of the objective, physical world.

Yet today the prevalent intellectual temper concerning scientific and medical knowledge has undergone a profound metamorphosis. If the Promethean incubus that fettered and impeded the emancipation of the sociology of medical knowledge was philosophical obtrusiveness vis-a-vis the distinctive ethos of modern science, then its oppressive shackles have been unbound. For recent currents within the post-Wittgensteinian analytical tradition of the philosophy of science have converged (albeit with some internal differences) on a conception of scientific knowledge that radically undermined the assumptions which underwrote the earlier historiographic mystification of medicine.

To summarise this wide-ranging intellectual eversion it may be stated that the Mertonian 'norms' and 'institutional imperatives' of universalism, communalism, disinterestedness and organised scepticism

(to which subsequent Mertonians added emotional neutrality, independence, impartiality and others) stand increasingly vulnerable as intellectual guides to understanding whatever 'distinctiveness' is presumed to characterise the ethos of modern science. For 'facts' - in the older tradition, the empirical bedrock which assured scientists that their theories corresponded to, and accurately reflected, the 'realities' of the external world - cannot be expressed in a neutral, theory-free or 'meta-theoretical' observation language. There is no easy distinction between fact and theory, nor between theoretical and observational terms. Scientific laws are linked in symbolic networks, not established by reference to isolated empirical instances.(42) As all empirical statements are inevitably theory-laden, the connection of factual statements or propositions with the external world is problematic.

Nor are there any readily established criteria for assessing the 'scientificity' of knowledge claims. The 'replicability' of experiments - seen by some as guaranteeing the objectivity of science - is not independent of a theoretical context, nor of specific analytical commitments; and, in the last analysis, 'replicability' only achieves the intended 'results' if the scientific community is agreed on its function, role and legitimacy.(43) What counts as a 'valid' replication experiment is not 'given', but actively negotiated by

members of the scientific community.

The under-determination of scientific knowledge by laboratory or any other observational evidence is today quite widely accepted. Any attempt to salvage some epistemological specificity for science on the basis of 'the scientific method' obscures the crucial point that the 'correct' scientific method is itself a social process in which a wide range of contextual contingencies is potentially relevant to explaining its 'scientific' products. There are, in short, no universal, invariant criteria that confer any privileged epistemological status on scientific or medical knowledge.(44) Sadly for philosophers, the time is passed that their Owl of Minerva might spread its wings without impairing its flight.

The development of medical knowledge is an inter-generational process whose nature and character is a matter for theoretical and empirical investigation in the field of the human (social) sciences, rather than for abstract philosophical speculation. The recent historiographical revolution has stimulated a greater awareness of the significance of cross-currents between bio-medical knowledge and socio-political thought, activity or structures - for example, of the relationship between institutional power and scientific accomplishments; the connection between the diffusion of medical innovation and the social structure of the profession; and the association between the various

social functions of doctors and the forms of medical knowledge they develop or embrace in different periods.

Some historians sympathetic to the progressive direction of these historiographical eversions have recently announced the emergence of a new paradigm, tentatively termed 'social constructionism'.(45) It entails no commitment to any monolithic value-system nor to any methodological imperatives beyond a willingness to question the self-evidence and beneficent neutrality of modern medicine, and an acceptance of the potential relevance of sociological perspectives to an understanding of bio-medical knowledge, both past and present. This study of Victorian medical education is intended as one small contribution to the emergent current of social constructionism.

Foucault, 'Quasi-Structuralism' and Medical Education

"It is understandable ...that medicine should have had such importance in the constitution of the sciences of man -an importance that is not only methodological but ontological in that it concerns man's being as an object of knowledge." Michel Foucault.(46)

The demise of Michel Foucault in 1984 poses to the historian and sociologist of medicine alike one question of singular import- how is one to interpret, assess and evaluate the corpus of Foucault's writings on the historical evolution of modern medicine as a system of 'scientific' knowledge? Both the prolixity of Foucault's discourse(47) and his stubborn defiance of categorisation in terms of intellectually fashionable

labels such as 'structuralism', 'deconstructionism', 'post-Marxism', or 'hermeneutics' present commentators with exegetical difficulties of Herculean proportions.

Foucault's intellectual project, moreover, has undergone considerable development with 1968 customarily regarded as the major climacteric. Comprehensive critical evaluation of Foucault's 'oeuvre' is well beyond the scope of the present enquiry.(48) My concern here is with delineating the cardinal elements of a distinctively 'Foucaultian'(49) perspective on medical knowledge with particular reference to medical education. I contend that despite Foucault's dense, at times impenetrable, prose and his intricate and labyrinthine themes, his insights are so profound and so germane to the primary considerations of this thesis that his ruminations on modern medicine must be understood. Wider questions of interpretation - and, in particular, the shift in the primary intellectual focus of Foucault's work from a 'structural archaeology' to a quasi-Marxist 'analytics of power' and finally, to a quintessentially Nietzschean project of 'genealogy'(50) - will only be touched upon insofar as they relate to our understanding of Foucault's grasp of medical knowledge and medical education.

The Birth of the Clinic

The most fruitful starting-point for an examination of Foucault's decisive contribution to the history of medicine would be to unravel the complexities of "The

Birth of the Clinic"(51) - his only book devoted exclusively to 'choses medicales'. Ironically, in view of the predictable tendency of Anglo-American empiricists to dismiss or condemn French intellectual products as 'rationalist' or 'metaphysical' verbiage, Foucault's treatise contains a rich abundance of empirical detail and meticulous scholarship. As Sheridan has legitimately observed, "with Foucault it is always difficult to produce a summary of the argument that has much validity and pitch independent of the supporting detail: the detail is of the essence."(52)

Notwithstanding this difficulty I shall offer a thematic summary of Foucault's major theses, drawing liberally upon the vocabulary and nuances peculiar to his somewhat idiosyncratic symbolic universe.

"The Birth of the Clinic" is Foucault's attempt to determine and specify the pregnant moment of mutation in medical discourse in the late eighteenth century when a radically new structure displaced the old and forged a new alliance between 'words' and 'things'. Foucault's primary preoccupation is with a new positivity in medical discourse at the level of the empirically perceived which established the sovereign power of an all-embracing empirical gaze. Prior to the late eighteenth century, classificatory or nosological medicine reigned supreme. It organised diseases into hierarchical families, genera and species so that what was seen was determined by established codes or

structures of medical knowledge.(53)

Physiological knowledge in this nosological medicine was only marginal, abstract theoretical knowledge for the doctor, who might disregard the complaints of the patient as irredeemably subjective and valueless from the point of view of diagnosis and therapy. The physician's task was to identify the patient's illness in conformity with a largely predefined classificatory scheme, and to prescribe the remedy appropriate for the type of illness in question. When Gilbert enjoined his students to "never treat a disease without first being sure of its species"(54), he conveyed the defining characteristic of classificatory medicine. Because of the high status accorded to medical theoria the physician was able to judge the idiosyncracies of the patient's medical history or the peculiarities of his or her constitution to be tangential phenomena - mere 'bouillon' - subordinate, in the last analysis, to the pure, uncontaminated essence of the disease.

Foucault demonstrates how this pervasive mode of medical perception was profoundly transmogrified during the French Revolution and its aftermath - a transmogrification associated, above all, with the emergence of the modern clinic - not simply as a medical institution where the sick were treated, but as the central locus and irremovable fulcrum of the entirety of medical experience.(55)

Wherein lies the supreme mythological significance of

the hospital in the foundation of modern anatomo-clinical medicine? The answer to this deceptively obvious question takes us to the heart of Foucault's thesis - that the clinic allowed physicians to 'see' what had for centuries been shrouded in a veil of mystery, impervious to the doctor's gaze. Hence the founding in 1793 of the Saint-Eloi Hospital, which was the institutional product of a powerful convergence between French revolutionary political ideology and the emergence of new medical technology symbolised, for Foucault, the disemboisement and transudation of a hitherto unprecedented domain in which medical truth was transparent to itself and the concrete field of 'experience' was forever assured by the omnipresent and omniscient focus of an indomitably and unyieldingly empirical gaze.(56)

The configuration of knowledge around which this medico-epistemic 'bouleversement' took historical shape was pathological anatomy. The historical development from Morgagni to Bichat of this clinical science 'par excellence' bears eloquent testimony to the seismic structural shift which Foucault is emphasising. Morgagni and his close disciples Bonet and Lieutard were working on the anatomical dissection of human cadavers in the 1760s unchallenged by the religious authorities. Foucault, however, suggests that the succeeding generation of French clinicians led by Bichat felt that they were rediscovering pathological anatomy. The



explanation for the apparent paradox is that Bichat, forty years later, undertook his research in a spatio-temporal milieu in which the gaze had been restructured, in which pathological anatomy and the clinic had become indissolubly linked.(57)

The metamorphosis is also reflected in the transition from Morgagni and his predecessors' emphasis upon diversification in anatomy to Bichat and his generation's belief in a principle of isomorphism in the tissues based on "simultaneous identity and external conformation of structure, vital properties and functions."(58) Pathological anatomy henceforth became an objective, real and unquestionable foundation for the description and 'cure' of diseases. The primacy accorded to the surface gaze in Bichat's pathological anatomy reflected his commitment to clinical empiricism. The anatomo-clinical method had come of age and allowed medicine to proceed on the basis of discovering the localisation, the site and the origin of disease, which could be diagnosed and treated only in the the institutional locus of the clinic.(59)

If Parisian hospitals in the late eighteenth century were, for Foucault, the epicentre of a revolution in medical knowledge, their impact on medical education was no less cataclysmic. After all, it was primarily to medical neophytes that Bichat addressed his resounding and historic injunction to "<o>pen up a few corpses: you will dissipate at once the darkness that observation

alone will not dissipate."(60) Growing numbers of the landless, indigent poor in clinics at the end of the eighteenth century offered medical teachers passive bodies with which to demonstrate separate localised diseases and to systematise knowledge of disease processes on the secure basis of clinical experience.

The rearrangement of topographical space in the clinic furnished an organisational structure on which a new, coherent and unitary model for the simultaneous pedagogical transmission of medical objects, perceptions and concepts might be erected. The central importance of the hospital to anatomo-clinical pedagogy renders intelligible both Vicq D'Azyr's thesis that the organisation of medical teaching within the clinic would provide a "universal" solution to the problems of medical education(61), and Demangeon's belief that the clinic alone was capable of "reviving among the moderns the temples of Apollo and Aesculapius."(62) The birth of the clinic thus created the conditions of possibility for the immediate communication of teaching within the concrete field of experience.

From the perspective of the medical student, the rearranged topography of clinical space allowed a privileged perception of patients and their illnesses. It was no longer the principal task of student physicians to learn abstract and useless physiologies or immerse themselves in rationalist book-medicine; for they might now learn, as Fourcroy intimated, "the true

art of curing" at the patient's bedside (63) - the indispensable source of clinical experience. A variety of new medical techniques of physical diagnosis underpinned the profound alteration in medical students' perception of disease. The most fundamental of these was the practice of systematic dissection of human bodies, for this reoriented neophytes away from 'naturesphilosophische' speculations towards 'objective' knowledge of 'normal' and 'pathologic' organisms founded on real phenomena alone. Auscultation, palpation and percussion extended the perceptual capabilities of students and rendered the innermost secrets and deepest recesses of the body transparent to their penetrating gaze.(64) In short, post-revolutionary medical education became coessential with the pedagogical transmission of clinical methods, clinical experience and clinical knowledge.

The above abbreviated account of Foucault's themes in "the Birth of the Clinic" has been confined to exposition of the most salient features of Foucault's primarily epistemic conception of the late eighteenth century mutation in medical discourse and education - an integral component of the wider transition from the 'Classical' to the 'Modern' age. However, our account would remain partial and one-sided without observing that Foucault does, in part, attempt to relate the historical maturation of modern anatomo-clinical medicine to certain contextual social, economic and

political events. Organisational changes within the hospital system are not considered in isolation from the insuperable social problems spawned by the French Revolution. Foucault observes that by the second year of the Revolution 60,000 paupers were living in Paris presenting the political authorities with formidable disciplinary problems of social control. Foucault notes that "a structure had to be found for the preservation of both the hospitals and the privileges of medicine that was compatible with the principles of liberalism and the need for social protection ... "(65); and further contends that the birth of the clinic in the French revolutionary context may legitimately be portrayed as an "interest paid by the poor on the capital that the rich have consented to invest in the hospital"(66); and the new medical gaze as "a very small saving in the calculated exchanges of a liberal world."(67)

Power, Medical Education, and the Political Anatomy of the Body.

The socio-political dimensions of the birth of the clinic were relatively underdeveloped in Foucault's earlier pronouncements on the medical universe, where the focus was, if not exclusively, pre-eminently, epistemic. Subsequently, however, Foucault's interest in archaeological derivation of all-embracing, hermetically sealed and incommensurable structures of thought within which the myriad complexity of specific discourses must

ever be situated gave way to a more insistent effort to decipher the underlying socio-political mechanisms rather than the epistemological unity of systems of knowledge. A preoccupation with discursive mathesis and orthogenesis was replaced by a more engaged determination to grasp the elusive phenomenon of power.(68) How does this intellectual reorientation affect our interpretation of Foucault's understanding of anatomo-clinical medicine?

Foucault himself acknowledged some kind of epistemological rupture in the progression of his own intellectual development. Having absorbed the radical temper of events in Paris during May 1968 and their long-term political repercussions, Foucault reflected on the character of his earlier work:

"When I think about it now I ask myself what I could have been talking about, in *Histoire de la Folie*, for example, or *Naissance de la Clinique* if not power? Yet I am perfectly well aware that I practically never used the word and did not have that field of analysis at my disposal."(69)

Foucault's frank acknowledgement of the weakness and lacunae of his earlier structuralist hypotheses on clinical discourse and clinical medical education suggest the need to reformulate the defining characteristics of a Foucaultian paradigm on modern medicine. The principal requirement of such a reformulation is to bring Foucault's insights into the clinical culture of medicine into more explicit articulation with his later meta-theorisation of the

analytics of power; for the intellectual virtuosity of Foucault lies, in the last analysis, in his demonstration of the dialectical relationship between power and the formal structure of knowledge.(70)

Foucault does not offer us a 'theory of power' as such, but rather a set of analytical tools with which to apprehend power. Foucault's polemical counterfoil is the model of Leviathan in the study of power and its associated assumptions concerning formal, legalistic juridical sovereignty. He eschews this model in favour of a radically subversive conception of power as an omnipresent ubiquitous material agency permeating every sphere of society and operating in a multiplicity of localised micro-networks.(71) Continuous, exhaustive, productive and capillary, modern power can be reconciled, for Foucault, neither with the benign Parsonian sociological model of power as a functional agency of social cohesion; nor with the representation of power as a fundamentally repressive and coercive phenomenon (typified by Lenin's notoriously terse definition of the state as 'bodies of armed men').(72) Foucault relinquishes any attempt to ground a definitive principle of power in any formal social ontology, preferring to develop an analysis of power which uncovers the micro-mechanisms of its operation.

The real significance of Foucault's utterances on power derives from his neo-Nietzschean genealogical project of concretising a "politics of the discursive

regime" so that discourse and knowledge are grasped as mutually constitutive with the productive exercise of power. As Foucault himself expresses it,

"there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations."(73)

The discourse of clinical medicine evoked by Foucault in his earlier writings must, from the perspective of his later work, be rearticulated with examination of the new manifold mechanisms of power which accompanied the transition to the modern age. Foucault's more recent theoretical engagement with the complex web of inter-relationships that link power to knowledge and knowledge to power - the phenomenal zones of 'pouvoir-savoir' - suggest to the historian interested in the origins of modern 'scientific' medicine the importance of grasping the convergence of the political ideology and the assemblage of institutional, technological and discursive practices that 'produced' it. Greater emphasis should be attached to the necessarily dialectical character of the power-knowledge couplet - not in the sense that medical knowledge 'reflected' power relations, nor even in the sense that it was a distorted 'expression' of them, but rather in the sense that it was 'immanent' in them.(74)

If this characterisation of the critical elements in the metamorphosis in Foucault's understanding of modern medicine is correct, then we would expect to find in his

more recent pronouncements a concern to highlight the disciplinary function of medicine's new regime of truth. Foucault's "The Politics of Health in the 18th Century" (75) reveals that this hypothesis is indeed correct, for Foucault describes the emergence in this period of a health 'police' whose broad remit included the promulgation of general rules of hygiene, the economic regulation of the populace and the implementation of measures for public order. The ever growing expansion of the population underpinned a new awareness, on the part of the political authorities, of the urgent need to regulate the health and physical well-being of the populace in the interests of social and political stability. Bio-medical traits of the population became relevant factors for military and economic management and were the pretext for authoritarian medical interventions and controls, albeit imposed not solely from above by the 'state', but accomplished rather via the polymorphous circulation of multiple mechanisms of power throughout the interstices of the social body.(76) Foucault contends that the birth of the clinic and the correlative proliferation of anatomo-clinical techniques, knowledge and practices were integral components of a wide-ranging, pervasive apparatus of power with which to subject the body to intensified disciplinary control and surveillance.

It was not fortuitous that the reconstitution of the medical gaze in the clinic occurred contemporaneously

with institutional developments in schools, work-houses, factories and the penitentiary, which facilitated the 'scientific' management of potentially unruly bodies in social (urban) space.(77) The hospital, then, was merely one feature on the landscape of a ubiquitous ensemble of positive regulatory and institutional apparatuses of power which assumed in the late eighteenth century the generic form of 'police'.

Hence the intellectual strategy of "political anatomy" best characterises Foucault's more mature grasp of the medical universe. Foucaultian political anatomy permits us to comprehend the complex unity of apparently diverse sciences - such as medicine, penology, psychiatry, dietetics, sociology - whose common rationale resided in the subjection of the body and its surrounding space to the materiality of power to the ultimate end of the total administration of life. Modern clinical medicine, according to the perspective of political anatomy was an integral aspect of the 'medicalisation' of public discourse, whereby clinical description was employed to characterise and manage deviance and dissent. Political anatomy further suggests that medical mechanisms at once fabricated and subjugated individual bodies as epistemic objects and targets of power.(78) Small wonder, then, that Foucault's later writings on medicine are permeated with ominous phrases such as 'the age of bio-power', 'the carceral archipelago', and 'the disciplinary society';

for his central thesis is that medical discourse cannot be understood in abstraction from the exercise of clinical power, itself a manifestation of a deeper panoptic modality of power.(79)

The final concept which must be grasped if we are to assess Foucault's distinctive contribution to the study of modern medicine is 'normalisation'. Whilst the apotheosis of 'normalisation' was achieved with the invention of the Benthamite Panopticon, Foucault adopts the term to refer to a whole range of normative standards - biological, political, sexual, social - by which the characteristics and behaviour of individual bodies might be compared and evaluated, and through which those who failed to measure up to the appropriate norms might be identified and constituted as 'deviant'.(80) Normalisation was the end-result of a newly formulated impersonal demand for rationalisation in the economy, the polity and throughout the entire social body.(81) In the medical sphere techniques of normalisation were adopted by doctors and medical students subjecting the signs and symptoms of bodies to ritualised meticulous examination in those 'curing machines' that represent the modern clinic.(82)

Parallel with the evolution of reductionist clinical gaze to the body of the patient came a widening of its scope as a vast medico-sexual regime surrounded the family milieu, and a new science of sexuality - linked at once to the imperatives of both morality and medical

practice - was constituted.(83) The increasingly strategic role of medicine in supplying information to bureaucrats and administrators operating the machinery of power resulted in a vast increase in the quantity and comprehensiveness of medico-administrative knowledge. In sum, Foucault's more recent pronouncements on the medical universe are epitomised by his felicitous characterisation of clinical knowledge as first and foremost a fundamental aspect of a "jurisprudence of normalisation." (84)

To summarise retrospectively, Foucault's earlier work considered medicine from an 'historico-epistemological' standpoint. Foucault's cardinal emphasis was upon the dogmatic claims of clinicians as to the veracity, certainty and facticity of clinical knowledge securely ensconced in the self-evident truths of pathological anatomy.(85) The bedside of the patient provided the source of stable, constant 'clinical experience' on the basis of which clinicians proudly proclaimed their ability to diagnose and cure diseases independently from medical theory. Foucault contends that to to understand X medicine's pervasively clinical culture one must focus on its apparently inherent epistemology and legitimacy, and on the immediacy of the relationship with nature that the setting of the $\kappa\lambda\iota\eta\epsilon$ confers upon the clinician.(86)

In the sphere of medical education, Foucault suggests that the student was seduced by the new clinical gaze.

No longer finding its central rationale in the transmission via the library and lecture-hall of theoretical medical scientia, medical education increasingly took place in the clinic itself where doctor and student together probed patient's docile bodies to decipher their mysteries and to learn from 'real' clinical situations what could not be learned from the prescriptive edicts of textbooks.(87)

A new anatomical 'atlas' equipped the medical student with perceptual resources with which to 'see', order, categorise and interpret the bio-medical meaning of the amorphous, undifferentiated mass of the body. The new atlas produced and constructed (rather than merely reflected) the 'reality' of the body, resulting partly from new techniques and methods of physical diagnosis, and partly from an increasingly localised pathology, rendered the structure of the body legible to the student. The new medical gaze directed students to chart, observe and map the course of disease as revealed by signs and symptoms on a rearranged topographical diagram of the body.(88) Subsequently, the student defined illness and disease in terms of specific pathological lesions located at particular points in its darkest recesses. The birth of the clinic, for Foucault, inaugurated and was accompanied by a revolutionary climacteric in the principles and practice of medical education.

In his later writings emerges a genealogical

conception of medical 'science' clearly discrepant from that tacitly assumed in the intellectual tradition of whiggish rationalist historicism. Rather than highlight and implicitly applaud the progressive rationality of medical knowledge, Foucault argues medicine's 'scientific' advances intensified the means for the social regulation of bodies.(89) An integral component of a fundamentally carceral apparatus of power, the role of modern medicine was to provide some semblance of 'scientificity' to the branding of deviance and the supervision of normality. Medical discourse offered an apparently rational basis for the classification of individual bodies as 'criminal', 'insane' or 'sick'; and the rearranged space of the clinic furnished a technico-medical apparatus for their examination, cure and normalisation.(90) Foucault's later treatises demonstrate the acute difficulty of both distinguishing medical knowledge as 'ideology' from the practices of the clinic, and of separating technological medicine from wider socio-political dimensions of clinical management. Scientific medicine becomes a fundamental prop of a fundamentally disciplined society.

Comparative Remarks: Foucault, Jewson and Kuhn.

Two Anglo-Saxon writers with whom it is useful to compare Foucault are Jewson and Kuhn. Like Foucault, Jewson approaches the history of medicine with the aim of detecting the structures that make sense of, and give coherence to, the detailed episodes studied by

historians of a more empiricist bent.(90a) Jewson is interested in large-scale historic transitions which were analytically separable and distinct medical cosmologies. Each cosmology is viewed as an intellectual 'gestalt' which provides "those sets of axioms and assumptions which guide the interests, perceptions and cognitive processes of medical investigation" in the relevant period.(90a) Jewson sees cosmologies as analogous to linguistic codes which embody principles for the regulation of grammatical, lexical and syntactical dimensions of speech acts.(90b) Like Foucault, Jewson emphasises discontinuity: different cosmologies, like different codes, are incommensurable.

Jewson extrapolates from Ackerknecht's well-known periodisation of medical history(90c) to distinguish three separate cosmologies related to three 'modes of medical production' - 'bedside', 'hospital' and 'laboratory'. This typology of the transition from eighteenth century to modern medicine invites direct comparison with that of Foucault.

At first sight, Jewson's historiographical framework might appear to have much in common with Foucault's 'archaeological' form of intellectual analysis which was concerned with understanding the conditions under which forms of knowledge were historically constituted.(90d) With particular respect to medicine, Foucault shares Jewson's perception of macroscopic change occurring within a relatively short time-span. Thus Foucault

contends that,

"... in a quarter of a century, from 1790 to 1815, medical discourse changed more profoundly than since the seventeenth century, probably more than since the Middle Ages, and perhaps even since Greek medicine: a change that revealed new objects (organic lesions, deep sites, tissular alterations, ways and forms of inter-organic diffusion, anatomo-clinical signs and correlations), techniques of observation, of detection of the pathological site, recording; a new perceptual grid and on(sic) almost entirely new descriptive vocabulary; new sets of concepts and nosographical distributions (centuries-old, sometimes age-old categories such as fever or constitution disappeared, and diseases which are perhaps as old as the world - like tuberculosis - were at last isolated and named)".(90e)

Foucault asks the many critics habitually inclined to dismiss his 'archaeological' approach as rationalist metaphysics simply to compare 'la Nosographie Philosophique' with 'Traite des Membranes'.(90f)

Closer attention to the substance of Foucault's and Jewson's main arguments, however, reveals significant differences. Jewson's trajectory of development emphasises the long-term shift from a 'person-' to an 'object-oriented' cosmology. Each specific type of cosmology is not viewed as an epistemic field or accretion of medical practices whose form is a function of a particular cultural ambience, but rather as "mode of social interaction within the structure of relationships which surround the production of medical knowledge".(90g)

The constellation of meanings generated by the configuration of such structures reflects two

distinctive types of interactional network which are distinguished in terms of the individual attributes of persons, on the one hand, and the formal status of members, on the other, (i.e. the 'person' and 'object' cosmologies respectively). The former connotes subjective, idiosyncratic, unique and qualitative dimensions of individual patients; the latter refers to objective, recurring, measurable and quantitative characteristics of categories of sick people. (90h)

Jewson argues that the distinguishing features of eighteenth century medicine - the existence of rival monistic and speculative systems of pathology; the elaboration of taxonomic nosologies based on a symptomalogical rather than ontological view of disease; broad acceptance of the psychosomatic aetiology of illness; and widespread prescription of 'heroic' interventionist therapies - were a deep register of "the constraints placed upon medical innovation within the structure of social relationships between patients and practitioners". Eighteenth century medicine for Jewson was governed by a client-dominated system of occupational control in which the upper-class patient ultimately held sway over the consultative relationship in a society long to be noted for the hegemony of its aristocracy and gentry. The primary relationship between the physician and his client generated a conception of the patient as a whole person in the sense of an integrated

psychosomatic totality.

This holistic view of the patient as the focal point of medical knowledge became gradually but profoundly transmogrified in successive stages resulting by about 1870 in the dominance of the laboratory mode of medical production. The idiosyncratic experience of the sick man thereby became eclipsed by the blind inexorable laws of natural science - laws established by a detached community of medical investigators operating in a more centralised, corporate and professionalised system of occupational control. Under laboratory medicine, the doctor was effectively insulated from the patient as an integral existential being; the latter, indeed, became no more than a network of bonds between microscopical particles.(90i)

When Foucault writes that "<a>rchaeology is much more willing than the history of ideas to speak of discontinuities, ruptures, gaps, entirely new forms of positivity and sudden redistributions"(90j), it is clear that he inhabits an idiosyncratic symbolic universe quite different from Jewson's. While Foucault is concerned with an epistemic 'bouleversement' in which 'life', 'disease' and 'death' emerged as new objects of medical discourse, Jewson is concerned with the configuration of social relationships around which new forms of medical production were articulated.

Where Foucault suggests 'scientific' medicine was

born between 1790 and 1815 in the rearranged topographical space of the clinic, where doctors gained a privileged perception into the real nature of disease qua teratological phenomenon, Jewson sees scientific medicine emerging about half a century later when a new configuration of relationships between practitioner and client, and an unprecedented increase in social distance was accompanied by the erection of impermeable boundaries between the sick and medical investigators.

Foucault's genealogy of scientific medicine emphasises the transformation of medical discourse from a predominantly metaphysical type to a more direct empirical method of investigation in which disease became emancipated from particular bodies allowing systematic clinical science to develop. Jewson, in contrast, stresses the critical importance of the emergence of a scientific medical community with paradigmatic cohesion based on acceptance of the same set of cognitive maps, technical-instrumental imperatives and methodological prescriptions. A centralised and relatively homogeneous system of occupational control, according to Jewson, underpinned the historical emergence of such a community. Finally, Foucault's emphasis on the natural history of disease species in the eighteenth century contrasts with Jewson's on the centrality of the sick man as a whole person to the history of medicine during the same

period.

As demonstrated in the empirical chapters of the thesis, Foucault's insight into systematic philosophical clinicism is penetrating, but the metaphor of 'mutation' is too stark and his periodisation of 1790-1815 antedates the maturation, if not the genesis, of 'scientific' medicine. Jewson's more developed sociological analysis of the collective relationships surrounding the production of medical knowledge offers the medical historian the more fruitful heuristic framework in this respect.

However, caution is demanded regarding Jewson's generalisation that eighteenth century medicine was client-dominated while nineteenth century medicine was doctor-dominated. Recent research suggests that eighteenth century medicine was far more diversified, general practice far more extensive and available to a far wider range of the population, than would validate Jewson's model of general aristocratic domination over medical ideology and practice.(90k)

It would also be instructive, in our continuing attempt to clarify the constitutive elements of a distinctively Foucaultian approach towards medical education, to briefly compare and contrast Foucault's understanding of the epistemological status of 'scientific' knowledge-claims with T.S. Kuhn's conception of a scientific paradigm.(91) Certainly,

Foucault's earlier histories which emphasised the sharp discontinuities or epistemological ruptures between technical discourses suggest some prima facie compatability with Kuhn's notion of revolutionary paradigm-shifts in the historical development of the natural sciences. Both Foucault's 'episteme' and Kuhn's 'paradigm' refer to structural frameworks which gave some consistency to the categories within which human thought was delimited for certain periods of time.(92) Moreover, Kuhn's consistent criticism of the cardinal tenet of whiggism - the necessary 'superiority' of our own scientific theories over earlier ones - parallels Foucault's meta-phenomenological scepticism concerning the rationality of 'scientific' knowledge. Both Kuhn and Foucault are equally suspicious of the realist notion that the progressive superiority of later over earlier forms of knowledge results from the cumulative way that succeeding theories approximate ever closer to an objective picture of reality.(93)

Beyond these similarities it may be suggested that the 'Anglo-Saxon' and 'continental' intellectual frameworks in which Kuhn's 'paradigm' and Foucault's were respectively elaborated point to more fundamental discrepancies. Yet the successive stages of Foucault's intellectual development render a comparison with Kuhn even more complicated than this would suggest. For judged alongside Foucault's earlier 'archaeological' phase of analysis where medical discourse, located

within all-embracing codes or structures of rationality, was comprehended in emphatically epistemic rather than sociological terms, Kuhn possessed the more developed sense of the way scientific knowledge and practices interacted within a constitutive socio-historical matrix. Yet from the perspective of Foucault's later thought on the dialectical inter-relationship of power and discourse, Foucault rather than Kuhn looked at the phenomenon of 'science' from a standpoint that was more insistently socio-politically 'engage'. Foucault's genealogy of power perhaps suggests to the critic of Western scientific and medical culture the possibility of assessing its emergence as a peculiar mode of coding power - a thesis which, if true, flies in the face of centuries of Western rationality in an ultimately more subversive way than does Kuhn's post-Wittgensteinian philosophical relativism.(94)

Finally, it must be acknowledged that most of the generalisations that I have considered here as legitimately representative of a loosely-defined Foucaultian paradigm on modern medicine are founded on the specifically French trajectory of the birth and maturation of the clinic. Foucault's observations are not, of course, confined exclusively to the French experience. He stresses, for example, the immense prospective significance of the historic link forged in eighteenth century Edinburgh between the medical school and the Infirmary representing the general principle

around which the whole reorganisation of medical studies was undertaken.(95) Nevertheless, the predominance of French sources in supplying the evidence on which Foucault documents the great metamorphosis in medical education and knowledge poses one question with peculiar force - to what extent does the trajectory of the historical development of medical education in the Anglo-Saxon world parallel and corroborate Foucault's interpretation of the French experience?

As we shall see subsequently, it is misleading to generalise too broadly from the French historical experience, or, a fortiori, to universalise elements of medical discourse and practice that were 'bounded' by a particular context of spatio-temporal distancing.(96) The notion of a medical or health 'police' (and its associated Foucaultian assumptions) holds less explanatory power in relation to English medicine during the nineteenth century than to French or German medicine of the same period.(97)

CHAPTER TWO

THE EIGHTEENTH CENTURY BACKGROUND: THE TRIPARTITE STRUCTURE IN TRANSITION.

Comprehensive explanation of the historical development of medical education demands tracing its changing connections and interaction with the corpus of medical knowledge, the internal social structure of the profession and the social structure of the wider society.(1) Chapter Two seeks to elucidate some elements of such interaction during the eighteenth century up to the passage of the Apothecaries Act in 1815, which provides an appropriate terminus ad quem. The tripartite legal and internal social structure of the profession was the customary reference point in discussions of the medical politics of the period; but so far as medical practice was concerned the distinctions between physician, surgeon and apothecary had long ceased to have any real rather than purely formal significance. The linguistic terminology of separate ranks and orders was nevertheless used by the historical actors of the period and accurately reflected the way that stratification was conceived in pre-industrial society.(2) The medical education of physicians, surgeons and apothecaries will be examined in turn, but to avoid the static connotations of adopting such a structure its dynamic breakdown at the level of social action will also be emphasised.

Physicians.

"On the dignity of the profession I need say little. I suppose you are well satisfied

that you have chosen a reputable one. Whatever may have been the pride or caprices of a few countries it has generally been looked upon, and with good reason, as one of the most liberal. To excel in it requires a greater compass of learning than is necessary in any other. A knowledge of mathematics, at least of the elementary parts of them, of natural history and natural philosophy, are essentially connected with it; as well as the sciences of anatomy, botany and chemistry, which are indeed its very foundations." John Gregory, 1772.(3)

Physicians were undoubtedly the wealthiest and most powerful of the three medical estates of the eighteenth century. Few in number but high in reputation, physicians constituted a tiny elite among medical practitioners, able to exert a disproportionate influence on the medical affairs of the day. Acutely conscious of their elite status, physicians asserted their commonality with the ruling gentry through their refined manners, deportment and attire. The gold-headed cane that physicians ostentatiously carried with them in conducting their professional business was the most obvious symbol of their elevated social status.(4) The most successful gentlemen-physicians could become exceptionally rich. William Harvey (1578-1657) who was not a particularly successful practitioner of the seventeenth century, left as much as £20,000 in his will. The Quaker, John Fothergill (1712-1780), earned at least £5,000 per annum; and his colleague, John Lettsom (1744-1815), also a Quaker, earned as much as £12,000. John Radcliffe's (1650-1714) extraordinary success enabled him to live like a nobleman: he owned his own

coach, six landed estates and for some years held a seat in Parliament.(5) It was less easy to secure such rates of remuneration and rewards in the provinces.

In the middle-ages physicians had been trained in close association with ecclesiastics in the universities. Scholastic medical education was essentially an exercise in classical philology and hermeneutics based on the canonical texts of Galen, Avicenna and Anglicised versions of Salernitan tracts. Theoretical knowledge of medicine was the exclusive property of learned churchmen and physician-clerks who studied at university to learn, through formal lectures and disputations, the medical ideas of the Ancients and the Arabs. Diagnostic problems were approached in abstract, philosophical terms and usually comprehended in relation to some variant of classical humoral physiology.(6)

The development of medieval universities at Salerno, Montpellier, Bologna, Padua and Paris (on which Oxford and Cambridge were modelled), enabled physicians to secure and maintain the professional status denied them in the classical world. The university became a high status institution which transmitted to physicians a body of esoteric knowledge, clearly differentiated from general knowledge, preserved in Latin and acquired only through long and arduous education. The physician was able to claim greater technical competence and emphasise

the higher ethic of the university-schooled practitioner. Bullough has argued that the emergence of physicians as a profession (understood as a high status group that has become institutionalised) by the sixteenth century was "inseparable from the sphere of the university." (7) The practice and outlook of medieval medicine and the professional image sought by the medieval physician certainly exerted a long-term influence on medicine which is discernible in the medical education conducted by physicians in the early modern period.

The development of 'new learning' from the close of the fifteenth century onwards - associated with the revival of humanism and the secularisation of knowledge - gradually led to the replacement of many facets of medieval church activity with lay institutions. One such institution was the Royal College of Physicians, very much a child of the Renaissance as a secular professional body designed, initially, for the welfare of London physicians who no longer enjoyed the automatic protection and support of the established church. (8) It was primarily a licensing body chartered by Henry VIII that placed authority for the determination of who might legally practise medicine into the hands of medical practitioners themselves. When Thomas Linacre (1461-1524) successfully procured a royal charter for the London College of Physicians in 1518, his achievement represented a number of significant

historical firsts. It was the first historical instance of the licensing of physicians by a purely professional body (as opposed to the state, the church or the universities) on the basis of the claim that privileged knowledge of how medicine should be practised and of how medical affairs ought to be conducted demanded recognition and the granting of preferential rights and professional privileges. The RCP was the first institutional example of the medical profession understood not merely as an aggregate of prestigious individual practitioners but rather as a distinctively privileged social group.(9)

Under the terms of the charter and subsequent parliamentary regulations which "typified"(10) the gains of 1518, the RCP was empowered to regulate practice within the City of London and within a radius of seven miles around it; and also to license and examine practitioners throughout the kingdom. The College effectively held a legal monopoly on the practice of medicine, although graduates from the Universities of Oxford and Cambridge were exempted from all strictures. They also possessed extensive powers to control the dispensing of drugs which led to intense conflict with apothecaries, particularly in the seventeenth century.(11)

The government of the College changed relatively little in three hundred years. Although the original charter envisaged no distinctions of rank or grade,

clear differentiation grew up between the Fellows, regarded as full members of the College, and the Licentiates who had merely been granted a licence to practise as physicians.

Throughout the eighteenth century the RCP acted primarily as a disciplinary rather than an educational body. It was preoccupied first and foremost with maintaining its supremacy and its institutional and legal privileges against the incursions of lower orders of medical practitioner whom they regarded with an attitude of haughty disdain. Dr. Christopher Merrett was typical in his scornful denial of the capacity of apothecaries for the practice of medicine when he accused them of

"ignorance of all those things which are required in an able Physician, viz., the knowledge of Arts and Languages ... They are wholly ignorant of all Philosophy and the very elements of the Arts and therefore unskilful in knowing diseases and more surely their causes."(12)

Merrett here epitomised the attitude of mind of Fellows of the Royal College throughout the eighteenth century. Classical culture formed the secure bedrock of the art of physic and it was acquaintance with the immortal wisdom of the medical dialectic of the ancients, refined, where appropriate, by knowledge of more contemporary natural philosophy that enabled the physician alone to comprehend the true aetiological basis of disease. In the eyes of Fellows of the College of Physicians, knowledge of Latin and Greek and of the

classical 'oeuvres' was an indispensable component of the intellectual armoury of the physician. As Dr. Pitt insisted in 1705, "*in the Art of Physick the Laws and Precepts of the Ancients must be inviolably observ'd.*"(13) Such inviolable observation, in theory at least, demarcated physicians from their subordinates whose medical practices were portrayed as vulgarly empirical.

The primary objective of the College of Physicians as originally incorporated was "to guard the profession and public from men who profess physic rather from avarice than in good faith, to the damage of credulous people."(14) Jealous self-protection of monopolistic privileges rather than principles of medical ethics motivated the College's assiduous prosecution of the 'great multitude of ignorant persons' who flourished in the eighteenth century, the golden age of the quack or mountebank. From its inception, the College had been vigorous in its prosecution not only of quacks but also of any healers who dared to practise in defiance of its legal monopoly. When in 1687, the College offered its succour to the poor and indigent parishioners of London, it was less a humanitarian gesture than a calculated move of professional power politics designed to increase regulative control over the prices apothecaries charged for prescribing.(15)

Obsession with safeguarding its monopoly by punishing challengers to its legal authority was a simple

consequence of the inability of a small number of physicians (there were only forty-five Fellows of the College in 1745) to cater for the medical needs of a steadily growing population, the vast majority of whom were quite unable to afford the costly fees physicians charged for their erudition. Apothecaries, of whom there were over a thousand practising in London at the beginning of the eighteenth century, rushed in to fill the vast medical vacuum that had been opened up.(16)

Mutual enmity and suspicion between the two medical estates resulted in vituperative pamphlet warfare expressing the deep internal divisions and conflict between different types of medical practitioner in Georgian society.

Unfortunately many historians have tended to accept uncritically these pamphlets as viable historical evidence without sufficient grasp of the importance of the polemical context in which they were written. In particular, prima facie acceptance of apothecaries' embittered protestations at the unjustified monopolistic privileges of the RCP has distorted the history of the medical education of physicians during the eighteenth century. Conversely, tacit endorsement of physicians' haughty disdain for those whose medical labours involved hand rather than mind has resulted in a tendency to underestimate the standards of the education of apothecaries and surgeons. The 'standards', furthermore, of the different estates' medical education cannot be

established in isolation from the social evaluation differentially placed upon them.

If the RCP rapidly deteriorated from its inception into an exclusive, self-perpetuating elite group in which social connections took pride of place before the advancement of medical knowledge and public health, what precisely was its educational role and function? Historians have long debated the answer to this deceptively obvious question with apologists like Sir George Clark(18) attempting to salvage some sense of Fellows taking their educational responsibilities seriously; and critics like Roberts(19) drawing attention to the divorce between education and examination and the relatively minimal evidence of conscious educational activity.

Since responsibility for licensing did not necessarily involve responsibility for education, and given the vagueness with which educational requirements were specified, the critics have put forward the more convincing case. Fellows allowed the educational activities of the College to lapse. Examinations made little pretence at rigorous testing of candidates' mastery of the contemporary minutiae of medical knowledge and natural philosophy. Such lectures as were delivered under the auspices of the College in the eighteenth century tended to be ornamental in character and designed to elevate physicians' sense of their own erudition rather than advance medical knowledge of

disease with a view to therapeutic intervention.

Attendance at such learned ex cathedra discourses equipped physicians with precisely those qualities and characteristics - wit, sophistication, and erudition ostentatiously demonstrated by the grandiloquence of their Graeco-Latin phraseology - that would impress the gentry and squirearchy who comprised the bulk of their clients.

Few physicians allowed the educational programme of the RCP to distract them from pursuing their primary interest in maintaining lucrative practices. Not detailed cognisance of the mysterious forces that inflicted disease, epidemics and pestilence on their patients, but a cultured gentlemanly manner, impressive behaviour and the ignorance of their clients enabled physicians to develop their practices successfully.

From an educational point of view, the College of Physicians played a less than dynamic role in the intellectual universe of medical discourse in the eighteenth century. The College was an educational backwater with a tiny library deprived of resources which grew only by the vagaries of individual benefactions and witnessed little intellectual activity. It had no museum with which to illustrate the complex variety of God's created universe or to advance the science of comparative anatomy. It offered no awards or prizes with which to encourage student physicians to intellectual endeavour.

One anonymous pamphleteer of the eighteenth century accused the College of editing only one book (The Works of William Harvey) and of publishing only three volumes of medical essays in three centuries.(20) To accept such a verdict, however, would be to commit the historical solecism that has been criticised. Although the College published six volumes of medical papers in three hundred years, the fact that the Medical-Chirurgical Society produced eighteen volumes in forty years allows one to place the literary output of the RCP in perspective. The College also published a series of pharmacopeias (seven between 1721 and 1836) which gradually reduced the number of remedies in vogue and discarded what had come to perceive as 'superstitious' ingredients recorded in the pharmacopeias of the seventeenth century.(21) The College undertook no systematic investigations into the medicinal qualities of the substances which herbalists, folk practitioners and quacks were administering to the ailing population (and doubtless inflicting less suffering than the 'heroic' practices of regular medicine). As with all other forms of knowledge which loosely comprised the complex of subjects and disciplines perceived as 'medicine' in the eighteenth century, the interests of the College of Physicians in materia medica was primarily academic and philosophical rather than practical and utilitarian.

Throughout its history the RCP exercised its rights to carry out the functions of an examining body. Despite

Clark's apologetic and disingenuous attempt to bestow retrospective "high praise which the College deserves for its conduct of examinations." (22), most historians have recognised that the jobbery, bribery and corruption which Namierites celebrated as the dominant motif of eighteenth century political life, left an indelible mark on the educational practices of the RCP. No written examinations were required until well into the nineteenth century, and the standards of oral examinations were left to the arbitrary discretion of the examiners. When, in 1702, James Yonge presented himself for an examination to become an extra-licenciate of the College, he succeeded despite his difficulties with questions of anatomy and physiology, and his inability to draw on medical philosophy to explain the causes of the movement of the heart. Three years previously, Yonge had published a polemical treatise (23) attacking the medical practices of a notorious astrological empiric by the name of Salmon, and had partly dedicated the book to the College. At this time, the authorities were actively engaged in ritual prosecution of men like Salmon who challenged its precedence, privilege, legal monopoly and, most critically, its definition of 'legitimate' medicine. It is not unreasonable, therefore, to posit some association between Yonge's apposite dedication and his lenient treatment at examination.

Candidates for full Fellowships commonly faced more

rigorous scrutiny than Yonge, and were orally examined in the Latin tongue. Discussion of the propriety of conducting examinations in English took place in 1721 regarding Thomas Butler, a candidate for a London license.(24) So far as true physicians were concerned, the governing body consistently upheld the view that to abandon Latin for examination purposes would be to undermine their elevated standing as men of learning and cultured gentility. Many College Fellows concurred with the judgement of Thomas Withers of York at the end of the eighteenth century that "<t>he character of a physician ought to be that of a gentleman, which <could not> be maintained with dignity but by a man of literature."(25) Knowledge of the classical languages was an essential component of the literary apparatus of the physician and could be deployed to social ends. For this reason, the College's license examinations were conducted in Latin until 1830.(26) Ridden with abuses(27) and quite removed in underlying rationale from the meritocratic ideology that was to re-orient the practice of examinations in the Victorian period, their significance for physicians in the eighteenth century was to ensure aspirants possessed the latent status characteristics compatible with the collective image elite physicians wished to project ostentatiously to potential patients in the higher orders of Georgian society. The educational conduct and activities of the RCP throughout the eighteenth century broadly confirm

Roberts' generalisation that "the medical corporations have never fulfilled an educational role but have rather sought to exploit or maintain examining privileges." (28)

The RCP insisted its Fellows must have graduated at the Universities of Oxford, Cambridge or Dublin; simple possession (rather than the quality or content) of the degree was the over-riding consideration. At the ancient universities, from which religious non-conformists were strictly barred, doctors were educated with the sons of the prosperous gentry and aristocracy and acquired the mannerisms of the ruling elites. The sheer expense of formal university education ensured that none but a tiny minority could afford to undergo medical education at the ivory towers of Oxford and Cambridge. In 1697 Thomas Brown estimated the cost of a regular physician's education from matriculation to final degree at 1,000, and the cost of training for all three branches of the profession increased throughout the Augustan period. (29) The excessive length of a complete medical education at the ancient English universities must also have deterred many. The degree of Doctor of Medicine at Oxford required as much as fourteen years attendance at the university - comprising four years for the BA, three more for the MA, three more for the MB, and a further four for the MD. Yet the title of 'Doctor of Medicine' afforded no necessary guarantee that its owner possessed medical expertise. The RCP itself had no illusions about the real significance of the MD,

regarding experience and knowledge as much less important than the acquisition of appropriate connections and social authority. The regulation restricting College Fellowships to graduates of the English universities - a mechanism for the preservation of the social exclusiveness of physicians - remained in force between 1675 and 1835.(30)

It was not a wholly successful mechanism, however. Before the turn of the nineteenth century, an identifiably new breed of physician, whose values, interests and practices contrasted markedly with those of the elite, had emerged. This newer breed of physician took advantage of both increased opportunities for upward mobility generally, and of expanding opportunities for a broader-based and less noetic medical education, in particular. Whereas the older breed's social origins were impeccably genteel, the new originated more commonly from the swelling middling ranks of Georgian society.(31) Where the one held aloof from the empirical values of surgery, the other was increasingly disposed to adopt surgical techniques in routine practice. Where the one regarded technical innovations, particularly with respect to new methods of eliciting physical signs from the body, as potentially subversive of professional dignity(32), the other was more likely to embrace them. And where the traditional elite adopted a complacent attitude of non-involvement and disinterestedness in the clinical revelations which

were permeable to the doctor's gaze in the growing number of voluntary hospitals, the newer breed frequently saw themselves self-consciously as 'clinical' physicians.(33)

Because these differences reflect the emergence of alternative ranks among physicians, they raise questions about the adequacy of the tripartite model of professional stratification to convey nuanced distinctions within each separate rank. The order of physicians was clearly fragmented when many among its number were 'general practitioners' in all but name, and therefore engaged in branches of practice held in contempt by the old elite.(33a) Some leading physicians too diverged strongly from the conventional stereotype of the classically-educated scholarly gentleman, and raise questions about the possible existence of an alternative medical elite.

Dissenters, like the Quakers John Fothergill and J.C.Lettsom, excluded from Oxford and Cambridge and denied Fellowship of the College of Physicians, were critics of the established corporate elite and espoused a more liberal, 'civic-minded' medical philosophy.(33b) Thomas Beddoes was another - radical democrat and outspoken adversary of the professional status quo, he championed the cause of medical chemistry as a means of revolutionising therapeutics.(33c) Such advocates of the 'new' medicine were less inclined to develop social and

cultural links with the established gentry than with rising mercantile and commercial interests.

Table 2'A' indicates the changing pattern of RCP licensing in each quarter century between 1701 and 1825. The cumulative intake of Fellows, Licentiates and extra-Licentiates shifted markedly from a quinquennial average of twenty-two for the period 1701-1715, to a quinquennial average of seventy-eight for the later period between 1811-1825.(34) The bulk of the increase consisted of Licentiates in each period of expansion, and was particularly marked from the mid-eighteenth century onwards.

Table 2'B' indicates that this pronounced increase in the number of Licentiates took place in a period of sustained growth in England's population which at once stimulated and was reinforced by the entire complex of social, technological and economic developments commonly regarded by historians as the 'industrial revolution'.

The growth of commerce; the development of systems of transportation and communications; a shift in the geographical and economic centre of gravity between town and country, metropolis and province; the expansion of the middle-classes; and the general increase in prosperity(35) effectively transformed the market for medical commodities, and increasingly rendered absurd the haughty pretensions of London physicians to monopolise medical practices throughout

the growing number of voluntary hospitals, the newer breed frequently saw themselves self-consciously as 'clinical' physicians.(33) The division between these groups broadly corresponded to the distinction between Fellows and Licentiates of the RCP.

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the kingdom. Outside the metropolis the RCP proved unable to exert any genuine control over professional practices virtually throughout the eighteenth century, and failed to translate its disgruntlement at the growing number of practitioners with 'bishop's licences' into effective legal sanctions.(36) Observance of the letter of the law would have meant a few hundred physicians in 1800 attending the 'internal' medical needs of over eight and a half million people in England alone.

Table 2'C' offers critical evidence of how expanding educational opportunities for prospective physicians were, from the 1770s onwards, generating increasingly acute intra-professional conflicts within the RCP of London. At the outset of the seventeenth century, British medical graduates were educated almost exclusively at the ancient English universities; but as rival centres of medical education emerged as competitors, in two principal stages, the number of graduates from Oxford and Cambridge declined. During the first half of the eighteenth century, students educated at continental universities almost doubled - largely an index of the popularity of Hermann Boerhaave's extensive lectures on the 'institutes' of medicine, clinical pathology, medical chemistry and botany at the Dutch University of Leyden.

Table 2'D' reveals that Boerhaave's teaching attracted medical students from far beyond his native

Holland. Between 1709 and 1738, the period of Boerhaave's tenure of various professorships, as many as 764 English speaking medical students attended his lectures, although only a minority actually graduated there. In the second half of the century the phenomenal rise to international prominence of the medical faculty of the University of Edinburgh accounted for the statistical climacteric. The struggle to reform the RCP between 1767 and 1771 was primarily a social struggle between Fellows and Licentiates, exacerbated and brought to fruition by rapid changes occurring in Scottish medical education during the eighteenth century.

Licentiates of the RCP were technically just possessors of a license to practise medicine within the confines of a seven mile radius around the metropolis. They were deliberately excluded by the Fellows from any participation in the formulation of official collegiate policy. Growing numbers of Scottish Licentiates(37) were most aggrieved at the notoriously restrictive by-law: 'Nemo in Candidatorium ordinem admittantur nisi qui in Academia vel Oxoniensi vel Cantabriensi Medicinae Doctor creatus fuerit, idque post quam omnia in Statutis utriusvis Academiae praescripta compleverit, sine dispensatione vel gratia insolita', which effectively barred them from achieving the status, political rights and professional rewards of Fellowship. Repeatedly unsuccessful in the prosecution of legal sanctions against Fellows' by-laws, the Licentiates resorted to

violent intervention characteristic of the political behaviour of 'the crowd'(38) in the eighteenth century. Not until 1784, by which time Fellows had reluctantly revised RCP statutes to lower the threshold of entry to the Fellowship, was reconciliation (until the recrudescence of intra-professional conflict in the subsequent century) complete.

Waddington has emphasised the real significance of the Scottish dimension in the struggle to reform the RCP. Scottish graduates, who did not practise as pure physicians, threatened the traditional ideal of the erudite and cultured gentleman-physician. In all its actions the comitia of the RCP sanctified and attempted to perpetuate an idealised model of the physician by drawing social and cognitive boundaries around the status and knowledge appropriate to it. Although medical education at the universities of both Oxford and Cambridge was less stagnant and torpid than usually recognised(39), Scottish medical education (especially at the University of Edinburgh) offered the prospective physician something qualitatively distinct. Its educational product was a generically different kind of physician, one who was actively engaged in the general practice of medicine.(40)

The comprehensiveness and integrated character of the medical curriculum of the Scottish universities contrasted with the narrower range of subjects required by the RCP for its examinations. Branches of medical

practice tainted with the social stigma of manual labour and therefore traditionally regarded as outside the legitimate province of a gentleman-physician (such as surgery and midwifery) were simply excluded from the examinations of the college and remained so as late as 1834. In the medical faculties of Edinburgh and Glasgow, however, students could acquaint themselves not only with the traditional branches of medicine but also with surgery and midwifery, chemistry as applied to pharmacy, and medical botany.(41)

The authorities of the RCP were concerned about the growing number of graduates from the Scottish universities who, like William Hunter, had acquired prior experience of practice in the lower branches of medicine. Scottish medical education conduced to Licenciate physicians' desire to expand their medical horizons by engaging in broadly-based general practice, but threatened to undermine the professional dignity and social authority of the Fellows of the RCP. If the outstanding concern of the latter was to fight a prolonged battle against the growth of general medical practice then conflict with Licentiates was an inevitable concomitant of the social changes taking place in Georgian Britain which effectively demanded the expansion of general practice and undermined the tripartite hierarchical estate system of professional organisation and internal stratification. Of course, Licentiates had no necessary consciousness or value-

system corresponding to their professional activities as general medical practitioners as they wished to purchase whatever political and ideological cachet followed from their status as physicians as over that of surgeons and apothecaries, despite their differences with the comitia of the RCP. Yet as general practice became more entrenched, ideological changes became more evident and are readily discernible in the nineteenth century.

Both the social origins and the professional practices of physicians had diversified considerably by the end of the eighteenth century. Traditionalists among the London elite clung to the RCP's formal rights to regulate medical practice and expended much energy in denigrating the rival claims of all who, in their lofty conception, were of inferior status and worth. The interests of London's elite physicians and those of the nobility and gentry were symmetrical; the former strove through imitation of style and manner to be conspicuously 'in' the society of the latter.(42)

With increasing numbers educated at the universities of Leyden, Utrecht, Edinburgh and Glasgow it became more difficult to sustain the pristine image of the gentleman-physician. A large minority of even the Fellows of the RCP were not of genteel birth at the end of the eighteenth century. Formally qualified physicians of London were most likely to acquire a fortune through medical practice, although there were some eminent and wealthy provincials.(43) Even the most wealthy and

successful of elite London physicians, however, cannot be said to have occupied a place of precedence within the ranks of the upper class.(44)

The gentry was itself subordinate in the graded status hierarchy of eighteenth century England to the old aristocracy, which was internally sub-divided into baronets, knights, esquires and gentlemen. Physicians tended to be ranked at the bottom of this hierarchy. Medicine as a profession was less prestigious and wealthy than the other traditional professions of Georgian society - the army, the church and the law. By the end of the eighteenth century, in no small measure due to the shifting patterns of medical education and training, less served to differentiate the physician from his rivals, the surgeon and the apothecary, than had been the case at the century's outset.

Surgeons

"Physic has long been advanced to the rank of a Science, and it now stands conspicuously eminent among the learned professions: its reputation has been maintained by professors of great erudition and of superior talents ...; while Surgery has been held as an art or mystery; so much was it kept down by the power, the influence and the learning of the Colleges founded for the education of the Students of Medicine." Everard Home (45).

"Unless the conferences among ourselves are free from the disgusting artifices of a gainful trade, and unless our principle Exemplars are far above the suspicion of greediness, we cannot expect our sacred calling to obtain implicit confidence, or that the several gradations among our members shall be respected as Men of honour, - as Gentlemen exercising a humane

profession for nobler rewards than the humiliating pittance due to personal service." Anthony Carlisle (46).

The simple obstinate fact that surgery, as its very etymology indicates, involved manual labour hampered and obtruded the efforts of surgeons in the eighteenth century to raise their professional status and establish a reputation equal to that of the most prestigious gentleman-physicians. Surgeons' empirical practices and craftsman-like approach to remedying illness and disease through manual techniques had enabled the physician to assert unequivocal social and medical superiority.(47) While the physician was employing his erudition to elaborate sophisticated nosologies, pathological theories and systems, the surgeon had to intervene in disease processes - to suppure wounds, open abcesses, remove tumours, set fractures and develop various operative techniques.

Technically, the surgeon's formal function was to provide only necessary 'external' treatment, reserving diagnosis, prescription and the administration of 'inward' medicines to the physician and apothecary. In England the separation of medicine and surgery functioned in only one way, to the benefit of physicians, for the Act of 1518 (by which the College of Physicians was established) made explicit reference to surgery as a legitimate branch of medicine. Whilst there was no objection, therefore, to a physician adopting surgical practices if he so desired, a surgeon who

administered cordial to a wounded man was technically in breach of the law.(48) The eighteenth century, however, witnessed a degree of convergence between medicine and surgery; the RCP was more concerned to exert its authority against upstart apothecaries than surgeons.

If, as Bullough suggests(49), the long-term professional project of physicians had been accomplished by the sixteenth century through the prosecution of the study of medical scientia in the institutional context of the renaissance university, the underdevelopment of the surgical profession stemmed, in part, from the aloofness and disinterest of most university students on medicine in practical surgical subjects. Although evidence for the medieval period is fragmentary, it is unlikely that the art of treating wounds was allotted anything other than a very lowly place in the scheme of university studies.(50) The craft status of surgery militated against its acceptance as a scientia which was the most important criterion for inclusion in the medical curriculum.

A self-conscious elite of surgeons had attempted to crystallise a true scientia of surgery which required theoretical understanding of internal medicine rather than rule-of-thumb empiricism, but they failed to convince medieval physicians who successfully excluded all surgeons from their numbers. Not only were surgeons disadvantaged by their failure to develop any institutional ties with prestigious universities, but

the Church's strict prohibition of blood - expressed in the doctrine ecclesia abhorret a sanguine - cut them off from avenues of ecclesiastical preferment. The failure between 1421 and 1423 during the reign of Henry VI to organise the whole medical profession under the suzerainty of themselves and pure physicians, effectively consigned surgery to a long-term position of social and intellectual inferiority.(51) Rather than identifying socially and merging with highly-esteemed physicians, surgeons fused with lowly barbers and remained attached to them for more than two centuries.

In 1462 Edward IV had granted the barbers a royal charter which authorised them to practise surgery. They did not possess a monopoly as unincorporated guilds of surgeons existed in competition with them. In 1540, with the self-interested assistance of physicians, an Act of Parliament was passed which effectively united 'chirurgeons' with the barbers.(52) As with other medieval guilds, the Barber-Surgeons' Company was formed for the protection of common interests against the incursions of other groups which infringed upon its legitimate sphere of activity. The guild system operated on the assumption that the 'public interest' was best served by ensuring high quality production from proven masters of the relevant art or craft. Most guilds conferred exclusive rights to engage in particular types of production. The Barber-Surgeons as a craft guild ('Zunfte' rather than 'Gilden' in Weberian terminology)

controlled avenues of entry to their occupation, laid down regulations for training and apprenticeship, and stipulated necessary qualifications for membership.

A variety of socio-economic tensions and contradictions contributed to the gradual decay and break-up of medieval guild forms of economic organisation. Although it was through the guilds that municipal authorities were able both to organise a supply of goods and services in increasingly urbanising economies and to regulate the quality of products, tensions developed between guilds and municipal authorities as the former became more independent and exclusive. Internal divisions of interest also developed between master craftsmen, whose criteria of entry became more restrictive, and journeymen.

By the eighteenth century the guild system of regulated economic production was evolving into a 'laissez-faire' system of capitalist production in the face of industrial change, technological development, a rapidly expanding economy, and the emergence of national and international markets. The examples of the Company of Surgeons and the Society of Apothecaries reveal that guild forms of organisation nevertheless survived the period of transition.(54)

There is much evidence in the eighteenth century of self-conscious professionalising activity on the part of leading surgeons. The evident connection between the craft of surgery and the lower status of craftsmen in

eighteenth century English society generally, precluded surgeons from being recognised as gentlemen. The most obvious strategy for raising occupational prestige was to climb out of craft status by shedding the association with the barbers and identifying more closely with the professional mores of physicians.

Although barbers originally outnumbered surgeons by more than twenty to one, the Company's wealth was increasingly accrued through the efforts of leading surgeons, whose desire for independence had become unambiguous by the eighteenth century. Perceived disparity of status underlay the passage in May 1745 of an Act of Parliament for making "the Surgeons of London and the Barbers of London two separate and distinct corporations." (55) Disputes within the Barber-Surgeons' Company were quite similar to those between the Fellows and Licentiates of the RCP. Hamilton has observed that such internal conflict was similar to the controversies over leadership which developed in many guilds as the guild system decayed. (56) Whereas the Company had been relatively tolerant of quacks during the sixteenth and seventeenth centuries, its more assiduous efforts to prosecute them during the eighteenth century was another index of professionalising activity. (57) Nor can the more successful treatment of venereal disease during the early decades of the eighteenth century be dismissed as an explanation for the increasing prestige of surgery. Changes in the pattern and content of surgical training

were central to the emergence of a more self-confident and vigorous collectivity of surgeons.

Surgeons acquired practical training and experience through apprenticeship. An aspiring surgeon might attend the local grammar school until he was fourteen and then embark on an apprenticeship under a master surgeon for seven years before being admitted to the freedom of the Company. Unlike the RCP, the Company of Surgeons did not exercise a monopoly over its sphere of practice; but its members were partially able to regulate entry at the local level through the control of apprenticeship and the passing on of patronage. Tudor statutes requiring surgeons to obtain a bishop's licence were rarely enforced.(59)

Compared to physicians' education, a surgical training was relatively inexpensive. Thomas Brown, who at the turn of the seventeenth century estimated the total costs of a physician's education at £1,000 suggested a London surgeon would require about £120. Provincial training was probably less costly, but prices fluctuated. In the first half of the eighteenth century a growing number of aspiring surgeons were commencing their training in the provinces and moving to London to complete it. Some, like Charles White or Richard Kay, decided to remain there. Other pupils by-passed a full apprenticeship by entering the army or navy as a surgeon's mate. Surgeons were legally entitled to practise in civil life after three years of military or

naval service, and many took advantage of such opportunities.(60) By mid-century, families of middling rank below the landed squirearchy were coming to regard a surgeon's vocation as an apposite career for their sons, who were themselves attracted by the prospect of growing professional rewards.

Despite its predominantly practical idiom, formal education was finding an increasingly significant place in the instruction of surgeons, especially in London. It was partly an offshoot of developments in Scottish medical education, and was accompanied by the revival of anatomy as a subject for investigation. Since Vesalius (1514-1564) began independent investigations on the human body, it had become less common to rely solely on the infallibility of Galenic anatomy.(61) Anatomical dissections were occasionally performed in the early modern period, but entrenched social attitudes among physicians who insisted that the dignity of medicine could be assured only by a preoccupation with universal ideas, served to circumscribe the anatomical knowledge derived from them.

Illustration 'A' offers a pictorial representation of the sociological nuances of renaissance medical education which persisted centuries later. The professorial physician here delivers an ex cathedra discourse from an imposing ornamental raised desk. He reads from a canonical text, not deigning to soil his hands while below him a barber or surgeon dissects a

human cadaver. A medical student attempts to point out the anatomical structures revealed by the dissection. The professor either corroborates or corrects the student's hypothesis according to its conformity with the revealed knowledge of human bodily structures enshrined in the authoritative and definitive text before him. Learned physicians continued to hold the opinion that their professional dignity would be lowered if they meddled personally with the dissection of corpses. Specifically surgical understandings of anatomy were gained outside the walls of the university, where, in the early modern period, the practice of anatomical dissection had in any case largely been allowed to lapse.(62)

Yet anatomy was in a sense the surgeon's science 'par excellence'; for in making their diagnosis, surgeons had long attempted to correlate their clinical findings with structural changes observed in the body. It was difficult to operate without visualising the anatomical changes responsible for the disorders with which they were confronted. Even elite physicians, many of whom may have doubted that thorough acquaintance with anatomical knowledge of the human body was essential to their own professional practices, had come to believe by the eighteenth century that it was essential for surgeons. They, rather than physicians, were more responsible for the increasing acceptance of an 'anatomical' orientation to medicine in the eighteenth century.(63) Expertise in

anatomy became the elite surgeon's counterpart to the classical learning and erudition of the physician.

William Cheselden (1688-1752), a student under the anatomist William Cowper and a surgeon to St. Thomas' Hospital, was renowned for having attended both Newton and Pope. He was a leading figure both in the renaissance of anatomy and the related endeavour to raise the professional standards of English surgeons in terms of knowledge, technical skill, and conduct.(64) In writing a surgical treatise or publishing a text-book of medical observations, a surgeon such as Cheselden was more than merely giving technical instruction or compiling scientific information. Cheselden's "Anatomy of the Human Body"(65) published in 1713 became one of the most widely used texts of the period and served social ends as well as supplying the intellectual foundation for anatomical study. He intended to convey normative standards for surgical practice and norms of behaviour appropriate to enable the surgeon to secure recognition both by other members of the medical profession and the laity. Cheselden referred disparagingly to the activity of incompetents and charlatans whose mischief was impeding such recognition and he warned of the potential damage that might be inflicted by "a bold unthinking surgeon" or "an injudicious blood-letter."(66)

At the age of only twenty-one Cheselden embarked upon private anatomical tuition which, to the chagrin of the

authorities of the Barber-Surgeons Company, proliferated in response to keen demand. The Company's Court of Assistants rebuked him since his private dissections on his own premises were undermining the Company's public dissections and lectures at the Surgeon's Hall.

Notwithstanding censure, Cheselden continued his private anatomical labours. In 1711 his "Syllabus of Anatomy in Thirty-five Lectures for the Use of his Anatomical Theatre"(67) was printed, and between 1713 and 1741 Cheselden delivered four courses of lectures of two months duration each year.(68) His major literary work, entitled "Osteographica" (69) was an illustrated monograph of the bones of man and of animals. Although the Company continued to erect a formidable barrier to the acquisition of sound anatomical knowledge through proscription of dissections outside its own Hall, it was unsuccessful in preventing men like Cheselden, who spearheaded the separation from the barbers in 1745, from pursuing surgical anatomy as they wished. Many private anatomical schools in the metropolis and provinces alike were established, owned and organised by surgeons.(70)

Just as the primary driving force behind the dissolution of the Barber-Surgeon's Company in 1745 was growing disparity of status between the two orders, so the principal object of the new Company of Surgeons was to further enhance collective social standing. Raising academic standards and investing more resources in

facilities for dissection were supposedly among the objectives of the prime movers for independence, but the educational activities of the Company in fact deteriorated after 1745. Like the RCP, the Company of Surgeons were more preoccupied with the minutiae of examinations than with the systematic provision of serious anatomical or surgical education, despite Cheselden's efforts as Master from 1746 to have a new lecture theatre constructed for teaching purposes.(71)

The constitution and internal government of the new Company in many respects represented old corruption writ large. The most significant change from the pre-1745 period was the ostentatious way in which a premium was placed on pure surgery. Since the Company insisted it was "of no trade but of the profession of Surgery only"(72), those who practised lower status pharmacy or midwifery were systematically excluded from membership of the Court of Assistants, and also therefore from the Court of Examiners. A small oligarchical group of elite 'pure' hospital surgeons effectively exercised complete control over the daily operations and affairs of the Company. The governing clique of ten members of the Court of Examiners perpetuated their authority through the regulation that the office of examiner was tenable pro vita sua. It was of vital and long-term import that through concentrating power by these means into their own hands, hospital surgeons succeeded in differentiating their position and social standing from

the great majority of doctors whose work entailed keeping open shop, dispensing medicines, treating wounds and practising in midwifery or blood-letting. Historians have hotly debated whether this latter group are most satisfactorily understood in the eighteenth century context as 'surgeon-apothecaries', 'general practitioners', or simply 'doctors', but omnium consensu they constituted the overwhelming majority of medical practitioners.(73) Only a small minority could afford the luxury of a practice confined purely to surgery. This minority increasingly saw itself as the intellectual and social equal of physicians. In distancing their number from ordinary surgeon-apothecaries, elite surgeons at once helped to establish a higher status for surgery and chartered the terrain for future medical politics as the majority - excluded from power, prestige and social position - embarked upon a usurpationary struggle for professional equality.(74)

The Company's elite hospital surgeons provided little in the way of anatomical and surgical education at Surgeon's Hall. The lack of enthusiasm for anatomical instruction precipitated numerous attempts to revitalise the Company's educational activities. After the counter-productive Dissection Act of 1772, which permitted dissection only of the bodies of executed criminals, the court decided to revive the practice of annually appointing anatomical officers comprising two masters, two wardens, and two stewards. Dissatisfaction

with the slow pace of the expansion of anatomical teaching resulted in the annual appointment of a Professor of Anatomy with specific responsibility for the Company's provision of medical education. Despite the acknowledged eminence of those who held this position (for example, Henry Cline 1781-1784, William Blizard 1787-1790, John Abernethy 1792-1793 and Astley Cooper 1793-1796), courses were short, uninspiring and failed to compete with the alternative provision of medical education in private anatomical schools and hospitals. The Examiners of the Company found the practice of taking students as apprentices in their hospitals to be a profitable source of income. Ensuring the continuance of lucrative practice became the dominant preoccupation of the Company's governing authorities.

John Gunning, Master between 1789 and 1790 was unrelenting in his criticism of its educational achievements. "I am sorry to observe," he charged in his famous 'Philippic', "that you have instituted lectures neither in surgery nor indeed in anatomy of any degree of importance; nor have you held out any gratification or reward for rising merit." (75) Early in the next century such demands for meritocratic medical education were to find radical-bourgeois sublimation in the rhetoric of Thomas Wakley and the Lancet.

Of far greater consequence for the professional project of surgeons than the meagre educational output

of the Company was the rapid spread of voluntary hospitals throughout the towns of England.(76) Hospitals in fact proved crucial vehicles for the improvement of surgical skills and training, and for raising the status of surgery notwithstanding the 'craft' nature of surgical production. Table 2'E' lists the foundation of hospitals up to the end of the eighteenth century in both London and the provinces. Hospitals and infirmaries became a conspicuous feature of the eighteenth century medical landscape.

Traditionally, hospitals had been termed 'hospices' as they were the institutional loci of charity or hospitality for the needy. By the end of the eighteenth century they had become institutions for healing the sick poor with a variety of functions including the provision of medical education. By 1780 the hospitals of Guy's, St.Thomas', St.Bartholomew's, St.George's, Westminster, the London and the Middlesex together provided about 1,980 beds for poor patients of the metropolis and were attended by as many as twenty-seven surgeons.(77) In both London and the provinces, surgeons had played a prominent role in the foundation and support of new infirmaries. Medical teaching in hospitals tended to be conducted by, and directed towards, surgeons and was anatomically rather than physiologically oriented. Liverpool Infirmary, for example, which opened in 1749, was generously patronised by James Bromfield, local surgeon and Mayor of the town.

Similarly, Charles White and Edward Hall, sons of wealthy Manchester families, became surgeons and effectively established hegemony over the town's infirmary for nearly forty years.(78) Surgeons who successfully secured honorary positions in the new infirmaries were marked off from their fellows and virtually assured of higher esteem in the locality. As hospitals sprang up throughout the country, the place of medical men in local society was redefined.(79)

.As honorary surgeons improved operative techniques, partly in response to the greater availability of bodies of local indigents for medical research, and as they increasingly displayed their expertise through teaching, it became more difficult for elite physicians to maintain their traditional professional distance from their surgeon 'subordinates'. The development of hospitals was another crucial social phenomenon which undermined the traditional tripartite professional structure. As Holmes has contended on the subject of the proliferation of provincial infirmaries,

"<t>hese new foundations represented one more blow perhaps the ultimately decisive blow against those barriers which traditionally maintained the old tripartite segregation of England's medical practitioners."(80)

The interest of surgeons in infirmaries poses questions concerning the wider aetiology of their development. How is it to be explained that no less than twenty-three infirmaries were established in English

provincial towns between 1736 and 1779. Two myths may be dispelled from the outset: first, that these institutions were a simple product of some nebulous feeling of beneficent humanitarianism; second, that hospitals were a direct response to the industrial revolution. On the first, it may be acknowledged that the resources invested in infirmaries were the fruit of Christian philanthropy(81) rather than responses to new public health problems, but closer attention to the social composition and dynamics of provincial towns is required for a fuller explanation. Infirmaries offered a focus for the charitable middle-class and medicine was a major outlet for philanthropy; but infirmaries were also conceived with certain covert moral, religious and social control functions which represented the underside of philanthropy. The hospital movement was a means of social integration between county landowners and bourgeois town-dwellers as well as an exemplar of mutual social obligations between the wealthy and the poor which the former had an interest in encouraging and maintaining.

On the second point, a glance at the chronology of infirmary foundations in Table 2'E' is sufficient to dispel the idea of any simple unmediated relationship between hospitals and industrialisation. The provincial voluntary hospital movement had lost its momentum before the industrial revolution had taken off about 1760. Moreover, the majority of hospitals were founded in

relatively small country towns rather than the main centres of urbanisation.(82) Of course, industrialisation had a massive impact on problems of public health, and the inability of most conservatively organised infirmaries to respond to them spurred the development of dispensaries. By 1800, London's dispensaries were treating 50,000 people a year and many had thrown their doors open to medical students.(83)

In the long-term, the interest of surgeons in the hospital movement outweighed its lay origins in Christian philanthropy. The major impetus for channelling charitable bequests and donations came increasingly from doctors and particularly surgeons whose professional interest in hospitals stemmed from their desire for access to an abundant supply of . . . submissive patients conveniently congregated in a single institution in which the prosecution of medical science and education would be facilitated.(84) Surgeons, particularly those with honorary positions in the hospital, also had considerable vested financial interests in the continuance of the hospital movement and the new form of hospital-centred apprenticeship.

At Guy's Hospital from 1734 onwards, some apprentices were bound to individual surgeons for arranged fees which varied but were not untypically over £50 per session. Other hospital apprenticeships permitted students to follow and question all the surgeons employed in the institution. Lectures were not included

in the admission fees; a course in anatomy and surgery cost seven guineas; dissection five guineas; materia medica, chemistry and the practice of physic ten guineas.(85) For those who combined teaching with surgical practice, rewards could be phenomenal.

Cheselden, at the height of his reputation - gained largely for his development of improved techniques for lithotomy - commanded as much as £500 per operation, charged, of course, to his affluent private patients. Caesar Hawkins was said to have earned £1,000 per year as a phlebotomist; and Astley Cooper, who had acquired a reputation as a brilliant and careful surgical operator, for some years received an annual income exceeding £15,000.

For the select few, typically centred in the fashionable areas of the metropolis, surgery had become by the end of the eighteenth century a spectacularly rewarded profession. Yet if the majority of provincial and more generalist practitioners had been conspicuously upwardly mobile during this period, there was still a world of difference - in practice, income and ideology - between them and the oligarchy wielding power in the Company of Surgeons. Through organisational ineptitude the latter had arrived at a position at the end of the century whereby it was advised that its own constitution was illegal and that the authority it exercised was illegitimate. After a couple of years' legal and parliamentary wrangling the Surgeons received a Royal

Charter, and duly became the Royal College of Surgeons on the 22nd March 1800(87); but its new constitution scarcely affected either its educational outlook or its social and political standpoint on professional matters. At this time Thomas Wakley was yet five years old, but was to become an eloquent champion of the social interests of the new surgeons engaged in general practice, and an impassioned critic of the old corruption, nepotism, malpractices and monopoly of the closed self-perpetuating elite group of hospital surgeons on the Council of the RCS.(88) The political strategy he developed and the ideology he articulated implied that only the surgical elite had become in the fullest sense a 'profession' of medicine at the end of the eighteenth century.

Apothecaries.

"Apothecaries' profit is become a by-word denoting something uncommonly extravagant. This great apparent profit, however, is frequently no more than the reasonable wages of labour. The skill of an apothecary is much nicer and more delicate than that of any artificer whatever; and the trust which is reposed in him is of much greater importance. He is the physician of the poor in all cases, and of the rich when the distress or danger is not very great. His reward, therefore, ought to be suitable to his skill and his trust and it arises generally from the price at which he sells his drugs ... The great part of the apparent profit is wages disguised in the garb of profit." Adam Smith (89).

Scottish classical economist and philosopher Adam Smith evidently held the lowest of the three medical estates of the eighteenth century in some regard. Just

as the etymology of surgery served to stigmatise surgeons as craftsmen, so the apothecary was labelled a lowly tradesman or shopkeeper. Adam Smith's justification of the means whereby apothecaries earned their livelihoods stemmed from their legal prohibition from charging patients for their attendance or advice. The Royal College of Physicians jealously guarded the observance of this legal proscription which conduced to their interests and prompted intense intra-professional conflict with apothecaries - a conflict which reached a climax over the dispensary controversy in the early eighteenth century.(90)

Originally apothecaries were not differentiated from spicers, grocers or retailers who formed a heterogeneous amalgam of pre-industrial occupational groups, primarily dealing in imported spices and exotic materials from the East. English apothecaries had been organised as a guild since 1312.(91) Throughout much of the middle ages they earned their livelihoods mainly as itinerant sellers of medical products, although they later began to settle in the areas where they kept shop. In 1606 apothecaries and grocers fused in a common trade-guild, but ambitious apothecaries pressed for the establishment of a separate company in pursuit of an autonomous identity of higher status than that of the grocers. By 1617 the apothecaries were incorporated as a distinct trade-guild; and three years later secured a Royal Charter issued by James I to 'the Master, the Warden and Society

of the Art and Mystery of the Apothecaries of the City of London'.(92)

No grocer could henceforth keep an apothecaries' shop under penalty. The Company insisted on a full seven year apprenticeship and no apprentice was to be granted freedom to open shop without having passed an appropriate examination. As the power of guilds to enforce apprenticeship regulations diminished, literally anyone in England by the eighteenth century was able to call himself an apothecary, practise as such, and prescribe medicaments. The 'Society of Apothecaries', as it became known after 1684, did not even possess a monopoly of title: it did prove able to exert some authority over practice in London but beyond the metropolis it possessed no legal powers to enforce its regulations whatever.(93)

Significantly, London physicians had actively encouraged and aided the apothecaries to differentiate themselves from the grocers by founding a separate Company. In exchange for guild status the RCP expected strict compliance with its legal monopoly over the provision of medical diagnosis and advice, thus maintaining and perpetuating the traditional role of the apothecary as 'the physician's cooke'.(94) Apothecaries became increasingly reluctant to play this role of obedient servant or servile intermediary between the physician and his patient. The inability of the erudite physician to satisfy the health demands of the

population presented apothecaries with opportunities to flourish. As they grew in number apothecaries condemned more loudly the status quo which effectively imprisoned them in subordinate relationship with physicians.

In 1665 the Great Plague of London succeeded in driving London's physicians (together with their well-to-do patients) out of the metropolis to escape the pestilence leaving apothecaries with a clear field to practise. The admiration and respect they acquired from London patients served them well in their economic conflict with physicians in the eighteenth century.(95) By the end of the bubonic plague the role of the apothecary as practising healer of the sick rather than mere dispenser of physicians' prescribed remedies had become more established.

In response to the encroachments and extensive professional popularity of apothecaries, the RCP decided in the early years of the eighteenth century to consolidate the powers it had secured in 1682 to prevent unauthorised prescription, by making an example of one apothecary, William Rose.(96) Accordingly, the RCP had Rose arrested and sued him in the High Court of Justice for the illegal practice of physic within a seven mile radius of London contrary to the terms of Henry VIII's charter. The Court initially found Rose guilty, deeming that only a physician was legally entitled to diagnose disease, decide upon a remedy and order its application. On appeal in March 1704, the House of Lords, acting on

equity, reversed the judgement of the Queen's Bench and defined the scope of the apothecary as "to ascertain the nature of disease and to treat disease." (97)

Henceforth, the apothecary was legally entitled to 'practise physic' (i.e. to visit, advise and prescribe), but could still only charge for medicines and drugs administered, not for attendance or advice. (98) Since it was over a century before apothecaries secured remuneration for the latter, it is hyperbolic to portray the Rose case of 1703-1704 as a fundamental climacteric in the history of the apothecary, or as "the Magna Carta of the general practitioner." (99) It was, of course, a turning point in that the actual practice of medicine was no longer illegal, but only when they had established unequivocal legal rights to diagnose disease, prescribe and administer remedies for even the most serious ailments and to receive payment for consultation, would the metamorphosis of apothecaries from mere shopkeepers to practising family doctors be complete. As yet they remained in an ambivalent position; throughout the eighteenth century they were practising internal medicine albeit without possessing a physician's licence - a professional situation which fuelled their desire for greater equality of status and material rewards.

Apothecaries' ability to take advantage of changing opportunities for medical education facilitated their quest for upward social mobility. It must be

re-emphasised here that the avalanche of polemic emanating from physicians during and after the dispensaries controversy requires contextualist historicisation in order to avoid critically distorting our understanding of the medical education of apothecaries in this period. Physicians' protestations as to the allegedly banal character of apothecaries' education cannot be accepted at face value. Although a seven year apprenticeship constituted the formal foundation of pharmaceutical as of surgical training, apothecaries' education was far more diversified in practice than this would suggest.(100) Moreover, as successful medical practice for the 'lower' orders was more dependent on personal qualities, the observation of sickness, and experience than on the intellectual content of the medical theory of gnostics, apprenticeship was value per se and not necessarily an obstacle in the short term to the social advancement of the apothecary.

Contrary to the impression created by the self-interested rhetoric of university-schooled physicians, apothecaries were, throughout the eighteenth century, almost invariably educated at grammar schools before embarking on their apprenticeship.(101) Most acquired a reasonable proficiency in Latin which enabled them to decipher physicians' prescriptions. Nor is it unreasonable to assume that the typical apothecary had some familiarity with selective parts of the classical

'oeuvres' as English translations became more readily available. Furthermore, the apothecary might often outshine the physician in his knowledge of pharmacy and materia medica, and was aided in his task by the establishment of Botanical Gardens at Chelsea in 1680 and Kew in 1730.(102) Samuel Dale, a leading apothecary, not a surgeon or physician, was the author of an influential and highly regarded text on medical botany and materia medica entitled 'Pharmacologia' 1693.(103)

The Society of Apothecaries, organised as a joint-stock company and secure in its markets and profits, was no less conspicuous for its relative neglect of medical education than the RCP or RCS. Whilst the Society offered some supervision of the training of London apprentices in the traditional practice of the apothecary and examined candidates for apprenticeships in the rudiments of Latin (to test their capacity to decipher physicians' prescriptions) before they were indentured, its governing body did not view the Society's 'raison d'etre' primarily in educational terms.(104) Moreover, as an institutional embodiment of pre-industrial modes of social organisation, the Society's structural incongruity within British society became more apparent as the pace of industrialisation from the mid-eighteenth century gathered momentum. By this time the Society of Apothecaries had assumed the character of a craft- rather than a trade-guild in that apothecaries were then making, compounding and

administering medicines rather than merely selling them.(105) Apothecaries were also giving more attention to treatment of patients in their own homes to such an extent that there was a large-scale exodus from shops in the latter half of the eighteenth century.(106)

Momentous social changes, as we have seen, underpinned the historical emergence of a type of doctor whose practice cut across the formally distinct functions supposedly appropriate to each of the medical orders. The apothecary was the most obvious potential beneficiary of these momentous social changes as the expansion of industrial and urban communities increasingly stimulated demand for the family doctor engaged in general practice, rather than for the more highly qualified and more expensive physician. The basic problem for the medical profession for about one and a half centuries after 1700 was how to integrate the new kind of medical practitioner into an established legal and institutional structure which could not, without changing, accommodate him.

Yet the potential benefits accruing to apothecaries from the transformation of the social and economic structure of British society in the eighteenth century were attenuated by the appearance of another group of para-medical practitioners, chemists and druggists. These are most satisfactorily understood not as a qualitatively distinct fourth 'order', but as a sub-class of apothecaries whose existence made the

professional status of apothecaries as a whole even more ambiguous and complex. Just as apothecaries were the object of the disdain of physicians and, to a lesser extent, surgeons, so apothecaries, as they themselves in turn developed a sense of professional pride in their work, came to regard chemists and druggists with an attitude of equal disdain.(107) Apothecaries frequently failed to distinguish (and thereby implicitly castigated) chemists and druggists from those 'betes noires' of all regular practitioners known as 'quacks' or 'empirics'. Furthermore, just as social changes affecting the character and operation of the medical market combined with the breakdown of effective licensing and regulation by local guilds and societies had conduced to apothecaries' ability to usurp some of the medical practice of physicians, so these same processes of social change permitted chemists and druggists to take over pharmaceutical practice, as regular apothecaries actively sought to shed their association with trade and become fully-fledged healers of the sick.(108)

Chemists and druggists had been slowly encroaching on apothecaries' medical terrain from the seventeenth century onwards. The Rose case of 1704 provided legal support for apothecaries' efforts to emancipate themselves from the humble status of 'physician's cooke'.(109) One of its long-term consequences was to swell the number of apothecaries engaging in general

practice, but in the short-term there remained a sizeable contingent of Freemen of the Society of Apothecaries who did not yet practise medicine but remained in the potentially lucrative trade of the apothecary's shop. This particular group of apothecary-traders were most perturbed at the growing financial success of chemists and druggists, and it was they who consequently persuaded the Society of Apothecaries in 1748 to promote a Bill in Parliament to strengthen its disciplinary powers against encroachment from below. Failure to secure an Act again conduced to the long-term consolidation of apothecaries as practitioners of medicine, and to the emergence of an underclass of chemists and druggists as the apothecary-trader disappeared. These trends were hastened on to fruition when, in 1774, the Society of Apothecaries passed a resolution whereby only Freemen who practised medicine could be admitted to the Livery.(110)

During the latter half of the eighteenth century, mutual suspicion and resentment between practising apothecaries and chemists and druggists rooted in different kinds of medical labour and disputes over the material rewards accruing to that labour resulted in an intensification of intra-professional conflict. Apothecaries were further disadvantaged by legislation which reinforced their subordinate social position, sanctioning physicians' rights to search shops and burn illegal drugs, whilst at the same time denying the

Society of Apothecaries the legal right to search the shops of lower groups of retailers in a similar way. The tensions and hostilities to which this situation gave rise were expressed in another bout of polemical pamphlet warfare.(111) The issue of appropriate charges for medicines dispensed brought matters to a head. Often with the active collusion of physicians, who vastly over-prescribed medicines for 'internal' illness and disease in exchange for positive recommendations to patients, some apothecaries proved able to amass considerable fortunes. Table 2'F' consists of the items recommended, administered and charged for by one apothecary to a well-to-do patient by the name of Mr.Dulby of Ludgate Hill during just one single day. The total bill for five days' treatment amounted to £17/2/10 - by no means a modest sum in this period.(111) Nor was such a rate of remuneration wholly atypical, especially for elite apothecaries centred in the metropolis who, according to Holmes, "unquestionably emerged with wealth enough to be able to act socially with the top crust of the medical profession".(112)

Yet it is erroneous to assume that apothecaries could command high incomes like this on a regular, consistent basis. The instability and vulnerability of apothecaries' financial position was classically revealed by the example of William Broderip, a provincial practitioner based in Bristol. In 1798 he amassed the phenomenal sum of £6,900 almost completely

from practising as a dispenser of medicines. Despite this exceptional annual income, Broderip was bankrupt within the span of only a few years.(113) The reason for his bankruptcy lay precisely in the proliferation of members of the class of chemists and druggists in Bristol, who engaged regular apothecaries in a vicious price warfare undercutting their often exorbitant costs for dispensing prescriptions.(114) Broderip was simply caught up in a complex social process of professional diversification and the transmutation of medical practice, itself an equally complex, mediated product of the transition from an agrarian to an industrial-capitalist mode of economic production. As the process of class formation took historical shape so professional identities were reconstituted, just as the character and social organisation of medical practice was transformed. Holloway has legitimately observed, giving expression to one of the necessary consequences of these evolving impersonal social processes that, "as the apothecary became the medical attendant of the middle-classes so the druggist began to serve the needs of the proletariat."(115)

Insofar as regular apothecaries were conscious of the largely, though not exclusively, empirical knowledge and experience they had acquired through their training as apprentices, supplemented by whatever advantage they had taken of greater opportunities for a more diversified medical education, they were able to sustain their

efforts to exclude the lower class of chemists and druggists from their ranks by drawing upon the intellectual resources and social cachet which possession of such knowledge and experience could purchase. One significant way in which an ambitious apothecary might bolster his case for upward social mobility around a particular configuration of socially valued and rewarded knowledge was through attendance at one of the many literary, scientific or medical societies whose proliferation was a conspicuous feature on the landscape of late eighteenth century British provincial life. Partly as a response to the extreme paucity of state support for scientific and medical activities, and also partly as a mode of cultural expression for socially excluded marginal groups, these societies mushroomed in the last third of the eighteenth century.(116)

Medical men among the local community often played an active part in both the foundation and ongoing business of these provincial societies. Over sixty per cent of the founding fathers of the Manchester Literary and Philosophical Society were involved in some kind of medical practice, and this association between the Society and medicine proved strong and enduring.(117) Similarly, the Lunar Society of Birmingham (famous for the involvement of Joseph Priestley who, as radical dissenter and scientist, personified the archetypal member of these provincial institutions) included medical practitioners among its membership, who

frequently aired, debated and illuminated the medical controversies of the times.(118) Fifteen individuals numbered the founding fathers of the Newcastle Literary and Philosophical Society, of whom over a third possessed medical connections of some kind.(119) In the Western provinces, the Bath Philosophical Society consistently maintained the active participation of a high proportion, over thirty-four per cent, of medical men.(120)

Societies were also established in the metropolis during this period. One of the first of the more formal type was the Medical Society of London, founded by dissenter J.C.Lettsom in 1773, with the explicit intention of bringing together physicians, surgeons and apothecaries in a common forum.(121) Lettsom's Society was but one striking example of the more general tendency of scientific and medical societies to atomise and undermine the traditional tripartite professional structure of medical practice by proffering an education that imparted forms of knowledge which cut across the formal divisions in each order's knowledge-domains implicitly enshrined in that structure. Whatever scientific and medical knowledge an apothecary acquired through attending such metropolitan or provincial societies doubtless raised his personal reputation and standing in the local community, which was the all-important consideration for a successful practice in the eighteenth century.

In 1799, William Charles Wells referred to "the complete establishment of the apothecaries as medical practitioners." (122) Even conceding the conventional whiggish portrait of the history of the apothecary in the preceding century - that 'rising' educational standards conferred deserved 'improvement' in social reputation and professional rewards (123) - many grievances nevertheless remained outstanding and had become intolerable by the last decade of the century. In sum, the apothecary was still despised by elite physicians and surgeons; still legally prohibited from charging patients for attendance or advice; effectively forced to earn a living by surcharging on drugs dispensed; heavily over-stretched by the rapid increase in the population; and subject to the vagaries of economic misfortune as chemists and druggists, competitively capitalising on his inability to cater for increased demand, took over his traditional pharmaceutical work. Such were the grievances which prompted agitation for legal reform of the licensure and regulation of medical practice. Most immediately, quarrels with encroaching chemists and druggists impelled regular apothecaries to take matters into their own hands by inaugurating a campaign which was to culminate in the passing of the Apothecaries Act in 1815. (124)

In the spring of 1793, a group of leading metropolitan apothecaries held a meeting for the purpose

of airing grievances and determining a strategy for the remedy of abuses. This famous meeting took place on 17th June 1794 at the Crown and Anchor in the Strand and was attended by more than two hundred people. All were united in their condemnation of two particular malpractices. First,

"<t>he encroachment which chemists and druggists <had> of late years made on the profession of the apothecary by vending pharmaceutic preparations and compounding the prescriptions of physicians <and second,> <t>he intrusion of uneducated and unskilful persons into professional practice, and the want of a competent jurisdiction in the profession itself to restrain ignorant and unqualified persons from practising at all."(125)

Because metropolitan and provincial apothecaries sank their customary differences, united in their determination to confront these iniquities, and co-operated to defend their common interests, participants in this meeting have been seen as articulating a discernible, if inchoate, general practitioners' ideology. Their main demands - to raise the educational threshold of entry into the profession, and to prohibit quacks, pretenders and irregular practitioners from securing the benefits rightly due only to properly qualified professionals - represented the central objectives in the manifesto of medical reformers which endured, as they remained unrealised, for decades.(126)

In the short term, the two hundred or so apothecaries present at the meeting decided to establish a society

under the title of 'General Pharmaceutical Association of Great Britain', whose avowed object was to extirpate the evils and counteract the morbid infection of chemists and druggists. In pursuit of these ends, the Association first despatched to the three medical corporations the massive evidence it had accumulated in relation to perceived evils; and second, petitioned Parliament for the extinction of druggists and stricter regulation of apothecaries' apprenticeships.(127) If the Association represented the first serious effort to reorganise medical practice on a comprehensive nation-wide scale, it failed to achieve any of its principal objectives and soon petered out into insignificance.(128)

More significantly, the GPA's political intervention proved counter-productive in the long-term as, far from re-establishing and consolidating their former privileges, apothecaries' high-handed attack on the occupational practices of chemists and druggists merely provoked the latter to counter-attack by inaugurating an alternative movement for the protection and advancement of their own interests - which was to culminate in the establishment of the Royal Pharmaceutical Society in 1841.(129)

Overall, it is quite mistaken to regard the GPA as a vanguard movement fighting a crusade on behalf of incipient general practitioners. The future of the apothecary, as this section of the thesis has suggested,

did indeed lie with the development of general practice; but this means that the GPA's preoccupation with preserving its traditional monopoly in the sale of drugs marked it out as a historically reactionary rather than progressive body, reinforcing the derogatory status of the apothecary as a mere trader.(130)

Although the momentum which had given rise to the GPA rapidly subsided, the contentious issues of professional demarcation it had discussed, stubbornly persisted. Between 1804 and 1811 Dr. Edward Harrison (1766-1838), a physician of Lincolnshire educated at Edinburgh, engaged in a determined but unsuccessful attempt to institute a programme of medical reform to resolve these issues.(131) His efforts were frustrated - portentously - by the rigid opposition of the RCP. The College's uncompromising political stance on any question pertaining to the exercise of its traditional authority was revealed in 1806 when, in response to Harrison's recommendations, it put forward its own proposals to extend its powers of jurisdiction over all types of medical practice throughout England and Wales. Had the RCP's proposed Bill been enacted by Parliament, it would have invested the College with unambiguous monopolistic authority to supervise and control the education, examination and professional conduct of every category of medical practitioner throughout the country(132). The undoubted intention of the RCP was to buttress its position at the apex of the traditional hierarchical

structure notwithstanding its effective disintegration during the previous century. Holloway neatly encapsulates the sociological significance of the RCP's strategy in the following manner,

"<a>t the very moment that the old categories within the profession were disintegrating before the demands of the new social order, the College of Physicians sought by legislative action to petrify an obsolete pyramidal structure."(133)

Although Dr.Latham's 'Outline of a Plan for an intended Bill for the Better Regulation of Medical Practitioners, Chemists, Druggists and Vendors of Medicine' was discarded, the RCP consistently held true to the principles it embodied throughout the legislation preceding the passage of the Apothecaries Act in 1815.

The antagonism of interests between dispensing chemists and druggists and apothecaries found its next concrete expression in practical action in 1812 when a heavy tax on glass induced apothecaries to reconsider political strategies for reform. At another famous meeting held at the Crown and Anchor on 3rd July 1812, Anthony Todd Thompson broadened discussion of those same grievances that had concerned the GPA to include much wider questions of medical politics. Although the Association of Apothecaries and Surgeon-Apothecaries was formed under the chairmanship of George Mann Burrows (1771-1846)(134), the reforming programme it espoused scarcely differed from that of its predecessor. Various proposals for legislative action were formulated and

exhaustively debated by the Association but foundered on the opposition of the Royal Colleges and chemists and druggists who petitioned Parliament against enacting any measures contrary to their interests.(135) The Bill eventually enacted on 12th July 1815 was a compromise measure whose major characteristics were determined by the balance of forces comprising the complex nexus of interest-groups which stood to lose or gain from its enactment.

The Apothecaries Act, whose most important specifications are set out in Table 2'G', has been the object of radically discrepant historical interpretations. An earlier generation of medical historians tended to portray the Act as a path-breaking innovative measure which inaugurated a new era of medical reform and furnished the educational foundation for the professional success of the general practitioner in the nineteenth century. Because certain specifications of the Act confirmed the importance of examination, licensure and the publication of the names of qualified practitioners on which later reforming medical legislation was based, its passing has been hailed, in Newman's words, as "the zenith of the apothecary in history."(136) Because the campaign which preceded its enactment was accompanied by much radical rhetoric, the Apothecaries Act, in this older conception, has been presented as an integral part of the wider reform movement of the early nineteenth

century and, more specifically, as comparable to the Parliamentary Reform Act of 1832. Hence Poynter has contended that the Act was "the first triumph for the reforming spirit which was clearly at work among them even in the first decade of the nineteenth century".(137)

More recently, the Apothecaries Act has been re-interpreted as primarily a retrogressive rather than a progressive piece of legislation which obtruded rather than facilitated the development of a system of medical education conducive to the professional emancipation of the 'modern' general practitioner. According to this conception, the Act was a defensive and reactionary measure seeking to protect the position of the Society of Apothecaries in the old hierarchy against radical demands for a more fundamental re-organisation of medicine. Holloway has certainly demonstrated how a close examination of the political tactics and manoeuvring of interested parties in the period immediately preceding the Act throws a very different light on its implications.(138) For the apothecaries were effectively out-manoeuvred by their rival medical orders. They were forced to abandon their proposals for an independent medical school because surgeons considered it prejudicial to their own schemes for the reform of medical education.(139)

More significantly, the RCP, fully cognisant of its long-term interest in obstructing any reform programme

that threatened the integrity of the traditional hierarchy, endorsed the final Bill only because it represented a degrading compromise on the part of the Association of Apothecaries and Surgeon-Apothecaries and the WSA. In as much as the Act confirmed the humble origin of the apothecaries, emphasised both their guild and trading activities, and placed the Society under the tutelage of the RCP, it celebrated not the interests of apothecaries but those of physicians. Those clauses which imposed penalties on apothecaries who refused to compound physicians' prescriptions and stipulated the continuing necessity for a five year apprenticeship (see (d) and (j) in Table 2'G') merely reinforced the subordinate role of the apothecary and rendered hollow his pretensions to acquire the intellectual, social and economic rewards befitting a gentlemanly and learned profession.(140)

The efforts and objectives of the radicals - which included the foundation of a medical school, complete prohibition of medical practice by the uneducated, and an attempt to challenge the legal separation of the medical estates as a means of raising the status of general practitioners - were effectively thwarted by the passage of the Act. Indeed, those who had campaigned for fundamental reforms on behalf of that "hybrid class"(141) of practitioner were bitterly disappointed at the turn of events in 1815. If their principal goal was to stem the tide of quackery and unqualified

practice, then the Apothecaries Act utterly failed to advance it. That the Association continued its existence until 1827 in a vain effort to secure amendments to the Act was an index of reformers' frustrations at having been deflected from achieving their objectives. As Gray observed in his supplement to the Pharmacopeia, the Apothecaries Act

"ha<d> had the singular fortune of being violently opposed as insufficient by those who were its original promoters, of being esteemed a burden by many of those it was meant to benefit, and of being looked upon with indifference by those against whom it was intended to act."(142)

For the ordinary practising apothecary, like Pendennis in Thackeray's novel, the Act of 1815 was a Pyhrric victory.

Clearly the debate over the long-term significance of the Apothecaries' Act in the history of the professionalisation of British medicine must be resolved in favour of the revisionist re-interpretation which emphasises its retrogressive dimensions. Further analysis of the educational and professional consequences of the Act can be found in chapter four.

CHAPTER THREE

THE POLITICS OF MEDICAL EDUCATION: PROFESSIONALIST STRATEGIES AND MEDICAL REFORM, 1815-1858.

"The study of medicine is a work of great labour when it is cultivated to a successful issue. The utility of the practice of medicine is acknowledged. It is not ... the interest of a class which is to be upheld by the promulgation of sound medical laws, but that of the whole of the connecting links of society." The Lancet(1)

"In the establishment and maintenance of a medical profession, it may be assumed that the aim will be that of forming a learned class, united in the common object of the cultivation of medical science, and of providing an adequate number of skilful practitioners." R. Inglis, M.P.(2)

Between the end of the Napoleonic Wars in 1815 and the passage of the Medical Act of 1858, English doctors waged a long campaign to establish their professional identity, to enhance their collective status and to increase the economic rewards accruing to medical labour. Medical politics had been far from quiescent during the later part of the eighteenth century. However, the period between 1815 and 1858 witnessed an intensification of the profound social changes wrought by the dual revolution - industrial and bourgeois-democratic(3) - as it grew apace and brought into existence, as it matured, a viable class society(4). The relative stability and simplicity of the older social structure - an image evoked by one historian's misleading notion of a 'one class society'(5) - was shattered as an unprecedentedly numerous population fragmented into diverse interest-groups whose place in the new society was not fixed or ossified within a given

static economic structure, but depended rather upon the outcome of processes of social negotiation and active political intervention(6).

In this section of the thesis, I examine the political activities of English medical men (for few women made any significant impact in the patriarchal arena of the early Victorian medical world) as they strove to establish themselves in the new social and political order. Many individual cases are cited, but the focus here is sociological. Historical actors are cited in order to display the collective professional strategies of the different groups and sub-groups they represented(7). In what follows, I emphasise the importance of internal conflicts between competing segments of the medical profession. Previous sociological theories of medical professionalisation have over-emphasised the systemic collective rationality of doctors' efforts to secure a permanent, state-sanctioned and richly rewarded professional monopoly(8). As a result, they have failed to recognise the vigour of an anti-monopolistic dimension to the English medical reform movement.(9) An adequate sociological analysis of nineteenth century medical professionalisation must be able to accomodate internal rivalries between, for example, medical 'scientists' and 'clinicians', or the medical elite and rank-and-file doctors.

Heterogeneous interest-groups put forward conflicting claims regarding the organisation and principles of

medical education, the remuneration appropriate to different kinds of practice and, most importantly, the definition of medicine itself. The successful establishment of professional status out of this 'pot-pourri' of contending claims and counter-claims, entailed political engagement and conflict with groups both within and outside the sphere of medical practice. Indeed the very meaning and scope of 'legitimate' medical practice was a contingent outcome of the variegated disputes which collectively comprised the English medical reform movement.

In this chapter I focus on three related but analytically separable themes in order to explain the longevity and complexity of the English medical reform movement. First, I demonstrate how arguments over the future direction of medical education were critical to the politics of reform, and consider the principal demands voiced by different groups of reformers.

Second, I examine the self-consciously progressive campaign of general practitioners to secure professional recognition and parity with those elite physicians and surgeons who were increasingly ensconced as consultants as the hospital movement expanded. I particularly highlight the anti-monopolistic dimensions of the general practitioners' campaign, as their importance to sociological theory of professional formations has been underestimated.

Third, I discuss another aspect of medical

professionalisation which is more compatible with the customary sociological focus on monopolisation. This relates to the strategy of orthodox, licensed practitioners to exclude diverse kinds of alternative, unorthodox healers from the professional recognition and privileges which the former held to be the rightful possession of themselves alone. I contend that this campaign of self-styled 'orthodox' doctors was indeed a strategy of exclusionary closure pursued to secure a monopoly over the market for professional (medical) services.

In the next chapter I complete my analysis of the politics of medical education and professionalisation by examining yet another alternative context in which the knowledge and expertise acquired through education and training was deployed to promote and advance the social interests of doctors. The shifting relationship between various categories of medical practitioner and that complex amalgam of governmental, administrative and judicial apparatuses which form the modern 'state' are the principal subjects of enquiry there. Finally, I consider the political-legal context of medical reform and demonstrate how the sociological analysis of medical interest-groups and the state developed here helps to illumine medical legislation - in particular, the Medical Act of 1858. Thus chapters three and four together comprise examination and interpretation of the complex political context in which English medical

practitioners sought professional status on the basis of their education in medical science.

Education, Politics and Medical Reform.

To what extent did medical practitioners of the early Victorian period regard their education as a central political concern on which their future as professional doctors depended? Of course, members of groups undergoing the process of professionalisation have frequently claimed that they collectively represent an exceptional and distinctive kind of occupation whose high socio-economic status is justified on the basis of their having acquired specialised competence vested in exclusive possession of a body of accredited knowledge which is unintelligible to the lay world.(10) The cluster of skills, understandings and practices held to be constitutive of professional expertise has commonly been acquired through attendance at advanced and often prolonged courses of education and training relevant to the specific occupation in question. If sociological theory suggests an a priori link between education and professionalism, historians may profitably focus, more concretely, on the mediating role of educational change in explaining the historical dynamics and flux manifest in different stages of the ongoing process of professional maturation.

Victorian doctors were certainly aware of the constraints imposed by the prevailing ethos of voluntarism and the 'laissez-faire' individualism which

underwrote the refusal of the British state to intervene in the educational arena at the primary, secondary or tertiary level until the later Victorian period. On the contrary, England's peculiar social development meant that medical practitioners, along with various other groups seeking to secure and maintain the status of a profession, faced a relatively limited and uneven system of primary education, a rudimentary and inchoate system of secondary education, and, above all, a system of higher education which critics charged to be more congruent with the hieratic and eschatological preoccupations of the schoolmen than with the concerns of the world's most advanced and industrially developed economy and society.

In fact, the term 'system' applied to Victorian education is, strictly speaking, an anachronism, for at no stage did government intervention amount to a coherent strategy or even 'policy' in the sense of pursuing foreseen and intended goals. Reform was largely the outcome of a series of particular decisions on specific issues arrived at in a thoroughly ad hoc way.(11) Medical reformers were consequently unable to rely upon state intervention to promote the wider educational reforms which would secure the most favourable environment in which their upwardly mobile aspirations might be realised.

The structure and function of the wider educational arrangements of Victorian England and the specific

content of educational experience were critical elements of the social matrix through which Victorian medicine was transformed into a distinctively modern profession - a group which has subsequently been regarded as the 'archetypal' profession, in comparison with which the degree of 'professionalism' exhibited and assumed by other occupational collectivities has been gauged and measured. In a sense, these larger issues concerning the extent of the provision for the education of the Victorian populace were primary and fundamental, for the outcome of strategies whose object was the professional advancement of medical personnel through the radical reform of medical education hinged critically upon the creation and maintenance of a fruitful, symbiotic and functionally compatible relationship between the particular and the general. Only if there was a degree of fit between a reformed system of professional education and the operation of the broader educational system of Victorian society would the anticipated social and economic fruits of the radicals materialise. As we shall see, even after the Medical Act of 1858, the ultimate political goals of the most self-consciously progressive movement for medical reform remained frustrated and were to resurface later.(12)

Although radical medical reformers were acutely aware of the close connection between professional emancipation and large-scale educational reform, the pernicious evils of their own medical education and

training elicited their most vehement condemnation. Medical reformers seldom spoke unanimously, were wrent by internal dissension and conflict, and advanced political views that comprised several and varying strands. Nevertheless, the outlines of the reformers' case against the prevalent system of medical education, the origins of their discontent, and the objectives of their political agitation are fairly clear.

The radicals' conviction that drastic reform of medical education was a fundamental prerequisite of wider professional reform stemmed from their dissatisfaction with the chaotic state of its organisation during the first half of the nineteenth century. During this period apprenticeship, though moribund, was only gradually dying out as the standard avenue of entry into the profession. Nineteen separate bodies continued to be responsible for the licensing arrangements in England, Scotland and Ireland. The situation was inimical to the reorganisation and rationalisation of medical education and training.(13)

Before the 1850s, the most outstanding and predominant characteristic of the latter was undoubtedly its marked heterogeneity. Those wishing to acquire the licenses of the medical corporations - the Licentiateship of the Society of Apothecaries, the Membership of the College of Surgeons, or the Licentiateship of the College of Physicians - might educate themselves by attendance at a variety of courses

provided by various institutions, including hospitals, dispensaries, private schools, provincial schools and universities.(14) From the utilitarian standpoint adopted and advocated by many of the reformers, such arrangements stood condemned as wasteful and inefficient.

These evils were compounded, in the eyes of critics, by the inadequacy of the standards deemed requisite for qualification and the ease with which healers proved able to practise medicine without any evidence of qualification. Low standards and the associated degradation of the profession were also frequently attributed to the economic structure of medical education and the parsimonious investment of financial resources in its support.(15)

Few radicals failed to perceive the intimate relation and mutually reinforcing character of the abuses they decried. The mischief caused by the chaotic and confused system of licensure was exacerbated by, and fed upon, the disorganised state of medical education. Opponents of the status quo often demanded a national, state-sanctioned system of licensure as a precondition of, and necessary accompaniment to, the establishment of uniform training and education for medical practitioners.(16) In 1841, Robert Inglis, a Member of Parliament and active participant in the movement for medical reform, urged the legislature to introduce "a comprehensive scheme of improvement", whose great desideratum would comprise,

"the abolition of medical apprenticeships; preliminary education, early discipline and the training of gentlemen; a comprehensive professional education; such encouragements and distinctions as may incite the highest attainments; sufficient criteria of knowledge and skill in the practitioners, such as the public shall be qualified to estimate; the separation of even the lowest departments of the profession from trade."(17)

Inglis' desiderata not only reveal something of the profound tension and ambivalence within the culture of professionalism (a complex and intricate amalgam of liberal meritocratic and traditional aristocratic values) but also furnish evidence of the principal objectives of the radicals. Many of his proposals amounted to a demand for a thoroughgoing and far-reaching transformation of medical education to the end of achieving professional recognition, status and rewards.

However, a more finely-textured analysis of the profession during this period is required to explain the dynamics of the reform movement. It entails a conception of the medical profession as a collage of conflicting segments and interests, constantly changing their complexion and their relative potency in the crucible of the Victorian medical polity. Not all medical men had the same interests at stake in the systematic reform of medical education. On the contrary, those who decried the absence of uniformity in the regulations for medical study, the laxity and insufficiency of examinations, and the anomalous values of the various diplomas were commonly

general practitioners, opposed throughout the campaign by a powerful elite of surgeons and physicians with consultant posts in the growing number of hospitals. If the core of the reformers' case was the argument that intimate acquaintance with medical techniques and expanding scientific knowledge was the prerogative of all doctors, and that the system of education should be restructured in conformity with this principle, then the overt interest of elite physicians and surgeons was in frustrating the lower medical orders' demands for professional parity and equality of opportunity. The Royal Colleges were the principal stalwarts of conservative resistance to the reform of medical education, and correlatively, the most especial objects of radical Benthamite polemical ire, political engagement and confrontation(18)

General Practitioners and Usurpatory Closure.

The general practitioner (whose proliferation was largely a response to the widening of the market for medical services rooted in the social pressures created and sustained by England's industrial revolution, demographic growth and urban development) had good reason to campaign for radical solutions to the mounting medical problems posed by the survival of a pre-industrial legal and organisational structure in a society undergoing capitalist industrialisation.(19) General practitioners became increasingly vocal about their grievances - which spanned social, economic and

political concerns - as they grew in strength and number.

Historians have found it difficult to construct accurate statistics to indicate the exact number of medical practitioners and the changing ratio between the different categories of practitioner in the early nineteenth century. More accurate statistics, of course, were to be one of the by-products of reform itself. Professions were not enumerated separately by the census authorities until 1841, when 33,339 persons were registered as practitioners in all the branches of medicine. Yet the medical directories of 1853 recorded 11,808 qualified doctors, implying that more than 20,000 were unqualified.(20) In any case, official census statistics are unreliable sources of evidence in so far as the categories enumerated are, strictly speaking, 'occupations' in a much wider and more general sense than is connoted by the term 'professions', however defined.(21)

A variety of alternative estimates has been proffered. John Massey suggested in 1834 that general practitioners outnumbered physicians by a ratio of approximately ten to one for the period 1812-1813(22), but he appeared not to consider the exceptional circumstances of the Napoleonic Wars.(23) Statistics issued by the medical corporations enumerating the candidates for their examinations and licensing arrangements offer another alternative register of

shifts in the distribution of personnel within the different categories of medical practitioner. Between 1815 and 1833, for example, the Society of Apothecaries examined 6,489 candidates of whom 5,769 were successful.(24) In 1824, 5,205 men were members of the RCS; by 1833, membership had risen to 8,125 - an increase of approximately sixty per cent in less than a decade.(25)

Doctors possessing both the MRCS and the LSA qualifications, which increasingly became the hallmark of the general practitioner, had become commonplace by the 1840s. James Bird estimated in 1848 that there were approximately 15,000 general practitioners operating in England and Wales, and that more than half of the total possessed the double qualification.(26) By contrast, the RCP in London in the 1830s counted only 114 Fellows and 274 Licentiates. Thus contemporaries and present-day historians have disputed the exact number of practitioners employed in the different branches of medicine. Yet omnium consensu, the overwhelming majority, representing over eighty per cent of the profession by the 1840s(27), were recognisable as 'general practitioners' - precursors of 'the family doctor'; a category whose very existence was implicitly denied by the formalities of the traditional tripartite legal and institutional structure which remained intact and in force until 1858.

The editor of the London and Provincial Directory

perceptively observed in 1847 how a new professional structure had emerged out of the old. "If we look around", he asserted,

"it will be found that the Physician, the Surgeon and the Apothecary as distinct and separate practitioners exist but little more than their several designations ... For whilst Physicians, Surgeons, and Apothecaries appear to be so vitally interested in the continuance of useless titles, they really are, by the force of a public convenience they cannot withstand, being gradually classed into Consulting and General Practitioners."(28)

General practitioners of early Victorian England assumed a critical mass not only in the numerical sense, for they had also become more acutely conscious of their strategic role and indispensability to the new regime, and collectively aware that the maintenance of the tripartite hierarchical order was the fons et origo of their thwarted professional aspirations. The professionalisation of general practitioners entailed more than the mere fact of earning a living as a full-time doctor serving the medical, surgical and pharmaceutical needs of the populace. It entailed collective consciousness of exclusive status qua general practitioner along with an acceptance of what came to be recognised as appropriate professional values and responsibilities. Whilst consciousness remained fixed on the status of general practitioner as an aggrieved and underprivileged type of doctor, it cannot properly be maintained, as has often been supposed, that medicine was a uniform or united 'profession' in Victorian

England.

Wakley, The Lancet and the Surgical Elite.

It was the self-confessed objective of Thomas Wakley (1795-1862) to foster general practitioner consciousness and direct it into politically productive channels.

Wakley was an English surgeon, born at Membury, Devonshire, who became a Member of Parliament for Finsbury from 1835 until 1852. He entered the medical profession through the time-honoured avenue of apprenticeship at the age of fifteen to an apothecary at Taunton. He subsequently transferred to a surgeon by the name of Phelps, and moved to the metropolis in 1815 as a student of the United Schools of St. Thomas' and Guy's, then commonly known as the 'Borough Hospitals'.(29)

Wakley experienced first-hand the vexatious restrictions, the abuses, nepotism and corruption surrounding medical education in London in the early nineteenth century, and he devoted his life's work to the elimination of the same. He poured scorn on an educational system in which students were compelled to pay extortionate fees to support hospital surgeons who appeared unable or unwilling to teach them; and ridiculed corporations which avariciously withheld from members the very benefits they had been brought into existence to bestow.

Wakley sought to establish general practitioners throughout the country as a powerful group which could effectively negotiate on equal terms with the

established medical corporations. To this end he eschewed the term 'general practitioner' which he argued implied and perpetuated a subordinate role in the social and intellectual ranks of the Victorian republic of medicine. Wakley's strategy was guided by a new conception of a unified and self-governing profession which would include all ranks of legitimate medical practitioner, and entail the systematic destruction of the ancient medical corporations.(30)

On October 5th 1823 the first issue of the Lancet appeared. Its publication under Wakley's editorship was per se a vital chapter in the social history of medical education and medical reform. Historians have long consulted the pages of the journal for a vivid illustration of the uncompromising tone of political partisanship and radical zeal which surrounded debates on the professional organisation and reform of Victorian medicine.(31) Initially, however, Wakley's pre-eminent concern was that the Lancet would furnish the medical student with a reliable and up-to-date source of scientific information with which to supplement his costly attendance at lectures throughout the various private and hospital medical schools of the metropolis.(32)

Wakley announced that he would

"publish to the medical profession the lectures of the hospital surgeons and physicians to their different classes; if they are good, so much the better for the profession at large who will read them in my

pages and for the students who have paid to listen to them; if they are bad their publication will let the profession see that the students are being taught by men unfit to hold the posts from which they draw large salaries, and to which they have been corruptly elected."(33)

Of course, it is artificial to separate the educational and political content of the crusading new medical journal, for Wakley's unequivocal utilitarianism suggested their interdependence. Hence from the outset Wakley emphasised that medicine was "a department of science so pre-eminently useful" that his ultimate aim would be to supply "in the most ample manner whatever <was> valuable in these important branches of knowledge"(34), irrespective of the opposition of interested parties. He recognised that giving expression to the grievances of the average medical student would elicit the opprobrium and obstinate defiance of many of their teachers who had a direct economic interest in obstructing a venture which effectively offered medical education of the highest quality for sixpence instead of about £5 or more per session.(35) Wakley's forthrightness soon brought him into legal and professional conflict with the most senior and eminent among the London surgical establishment - men such as Astley Cooper and John Abernethy, both former pupils of the archangel of English surgery, John Hunter.(36)

Elite surgeons were undoubtedly Wakley's principal 'betes noires', for whom he reserved the Lancet's most intemperate language and unequivocal condemnation. The

Council of the RCS, in Wakley's estimation, was an evil, corrupt and self-perpetuating body utterly indifferent to the interests of its members. The Lancet referred in 1827 to "the supineness, imbecility, illiberality, or dishonesty, of the rulers of our precious college."(37) In the same year, "the medical profession" - by which term Wakley meant the vast majority of everyday practitioners (whether physicians, surgeons or apothecaries) expressly excluding the medical and surgical elite - was described as "oppressed by an oligarchy, contemptible in point of talent, as well as of numbers."(38)

One historian has gone so far as to characterise Wakley as "a perfect nuisance", "vulgar and scurrilous in the extreme", and even "of feminine disposition"(39) - surely an example of normative judgementalism of the crudest and most flagrant kind. Wakley's supposed immoderation and extremism is, of course, more properly explained as an historically situated outcome and response to the particular social, economic and political circumstances of the Victorian metropolitan surgical elite.

For the conspicuous success and ostentatious wealth of England's leading surgeons was all too apparent to the type of practitioner whose interests were articulated and represented by Wakley and his supporters. As observed in the previous chapter, senior surgeons were able to earn enviably high professional

status and rewards. It was possible to gain annual remuneration exceeding £1,500 as a high-ranking London consultant. For each of twenty years after 1824 Benjamin Brodie was able to earn an average of between eight and ten thousand pounds.(40) Astley Cooper's wealth was phenomenal as for some years he amassed no less than fifteen thousand pounds.(41) Few, if any, could approach this kind of opulence, but even lesser-known metropolitan consultants - like Buxton Shillitoe FRCS, whose income had climbed, after a modest start to £1,700 in 1866(42) - proved able to secure rich rewards.

Surgeons' income from teaching could also be fairly lucrative. In his memoirs Sir James Paget recalled that in the 1830s it was customary to charge about five hundred guineas for a full four or five year pupilage, and double that amount for residential pupils.(43) In the mid-nineteenth century leading hospital surgeons in London regularly received five hundred to six hundred guineas through regulation fees. Some surgeons, like Frederick Tyrrell of St.Thomas' Hospital and Aston Key of Guy's, demanded upwards of £1,000 from their apprentices, and this during the 1820s.(44) The simple consequence of prestigious surgeons charging such extortionate fees for apprenticeships was to restrict access to what relatively few families were able to afford them and, correlatively, to force aspiring doctors of humble social origins to undergo less costly and prestigious medical training. By such means, though

tacitly rather than consciously or deliberately enforced, was access to the medical profession subject to a process of social regulation.

Like those of consultants, general practitioners' costs and earnings fluctuated widely both geographically and between different kinds of practitioner. Historians have therefore refrained from making over-hasty generalisations about their overall economic situation.(45) Medical education, as we have seen above, was expensive especially for apprenticeships with fashionable and prestigious surgeons, and must have deterred many an ambitious son of a lower middle-class family from pursuing a medical career. The example of Robert Pennington (1764-1849), an eminent general practitioner who boasted of earning in the region of £10,000 annually at the height of his career, was exceptional in the extreme.(46) More commonly, rewards from general practice were moderate, unpredictable and finely attuned to the vicissitudes and tergiversations of the local context. One historian has recently estimated that incomes from general practice between 1815 and 1850 ranged from a low of approximately 50 to an uncommon high of £1,000 annually.(47) A typical provincial practitioner(48), depending upon local contingencies, might earn perhaps £150 to £200 a year. Accepting the estimate that approximately £300 per annum was requisite to indulge the average range of Victorian middle-class expectations(49), general practice was

evidently not the optimum profession for those seeking material rewards alone.

However, it would be quite misleading to assign the internal rivalry between elite and rank-and-file surgeons exclusively, or even mainly, to economic causes. The lowly practitioner undoubtedly resented the affluence of his consulting superiors in comparison to the modesty and insufficiency of his own income. Nevertheless, the rank-and-file's grievances were not confined to protestations of poverty; they also commonly protested against the nefarious educational and political activities of that self-seeking and self-perpetuating elite who governed the corporations and steadfastly resisted any change in the long-established organisational status quo.

General practitioners' educational grievances stemmed from the absence of any institution whose exclusive purpose was to cater for their academic and professional requirements. In the agitation preceding the Apothecaries Act of 1815, the Association of Apothecaries and Surgeon-Apothecaries had debated the establishment of an Institute or College of General Practitioners, but the idea was subsequently suppressed.(50) In February 1826, at a meeting organised by associates of Sir Charles Hastings, eventual founder of the BMA, aggrieved general practitioners resolved that "the apothecary or rather the surgeon-apothecary <was> the sole medical attendant of a very large

majority of persons and so should have an adequate education."(51); but their educational aspirations remained unfulfilled. Five years later in 1831, at the instigation of Wakley, a London College of Medicine was instituted to bring together general practitioners from all three of the formally separate branches of medicine and rally the cause of educational reform; but the political climate was unpropitious as radical interest was deflected towards enactment of the Reform Bill, and Wakley's project petered out.(52)

The Lancet nevertheless continued to be used as a vehicle for relentless criticism of the multifarious abuses of medical education (and of the powerful sinister interests that perpetuated them) from a political standpoint sympathetic to radical Benthamite utilitarianism. The effectiveness of the Lancet's propaganda resided in the insistent way that drastic reforms in the system of medical education and licensing were presented as vital to the public interest.

In 1827, for example, the Lancet stressed that it was not merely "an injury to the medical student" that "facilities for acquiring professional knowledge" were deficient (because of "the cupidity of ... pretended instructors"); for it was, at the same time, also "an injury to the public" because "the early practice of medical men who <were> obliged to embark in their profession without the advantages of clinical instruction <would> necessarily be attended with much

uncertainty and hazard."(53)

The editors insisted that the subject of medical education was of paramount concern because

"there <could> be no security for the public health, except in the establishment of such tests of qualification as <might> ensure the competency of medical practitioners."(54)

The demand for rigorous and 'objective' tests as guarantees of competence was an integral aspect of a professionalising strategy based upon an instrumental conception of education that counterposed 'ability' to the gentlemanly culture and erudition of the old elite.(55)

It was obligatory, from the meritocratic angle of vision that informed the prescriptive edicts of the reformers, for each individual practitioner to undergo the most stringent examinations in order to ensure professional standards of practice. "<T>he only fact," editorialised the Lancet in 1827, "in which the public <should be> interested, <was> whether a candidate possess<ed> the requisite knowledge to enable him to embark in the practice of his profession." As long as a prospective doctor possessed such knowledge, the Lancet asked rhetorically, "what matter<ed> it where, under whose instruction, or in what space of time, he <had> acquired it?"(56)

Wakley's ire was here particularly directed at the monopolistic educational practices of the RCS. Restrictive bye-laws passed by the College during the

1820s effectively gave metropolitan hospital surgeons and lecturers a complete monopoly over the surgical education of the London student. Thus it was deemed,

"<t>hat certificates of attendance at lectures on anatomy, physiology, theory and practice of surgery, and of the performance of dissections be not received by the Court except from the appointed professors of anatomy and surgery in the University of Dublin, Edinburgh, Glasgow, or Aberdeen, or from persons teaching in a school acknowledged by the medical establishment of one of the recognised hospitals, or from persons being physicians or surgeons to any of these hospitals."(57)

In this way, a vicious monopolistic circle was created whereby the governing authorities of the RCS effectively appointed themselves to senior positions in hospital medical schools. In their formal capacity as official spokesmen for corporate educational policy, they took decisions which reverberated directly to the benefit of their own economic interests as consultant teachers of surgery. The Lancet continued to assail the "master evil" that enabled such a self-serving clique of "goose-brained monopolists" to legally deprive aspiring doctors of rights which ought to be enjoyed by "the ablest members of a noble profession."(58)

Reformers had just cause to decry and attempt to eliminate the abuses and corruption surrounding metropolitan medical education; for monopolistic practices and flagrant nepotism permeated the very fabric of the London medical world. Not only did the authorities of the RCS - having established their own

superiority in social, economic and professional matters - hold aloof from any attempt to improve the status of the general practitioner, but they even sought to deny rank-and-file surgeons their educational rights by depriving them of access to the College's Library and Hunterian Museum. However, it was the official regulation banning all but members of the Council from the front entrance to the College (profoundly symbolic of the hierarchical social order embodied in the institution) that elicited the most open expression of resentment and defiance by the rank-and-file.(59)

Nepotism was rife in London's hospital medical schools.(60) As we have seen, hospital teaching could be lucrative and private consulting practice even more so.(61) Senior hospital appointments also offered physicians and surgeons more opportunities for the significant exercise of power, as professional autonomy gradually displaced gubernatorial authority and lay financial control. Given the immense professional rewards potentially accruing at the upper end of the medical market, it becomes a matter of some importance to ascertain the extent to which opportunities for promotion existed in the voluntary hospital system, and the criteria by which applicants' suitability for senior consultant posts were assessed.

On this critical historical problem one scholar's verdict is unequivocal;

"<1>et there be no question at the outset:

scientific and technical standards of expertise and skill were not the primary criteria adopted for filling appointments. The governors' selections were made upon a variety of grounds, most of them unrelated to medical skill. The simplest to deal with were those of educational affiliation and seniority. Simply put, governors nearly always appointed to the senior staff men who had been students to their hospital's surgeons. While the new foundations of the nineteenth century had, by necessity, to appoint medical men trained elsewhere, the old established hospitals tended to limit appointments to their own 'old boys'."(62)

Peterson is quite correct to emphasise the persistence of such 'non-professional' criteria as personal connections and acquired characteristics inherited from the 'ancien regime'. At hospitals such as Guy's(63), St.Thomas'(64) and St.Bartholomew's(65), family relationships, networks of kin, personal animosities and political affiliations influenced appointments more than knowledge of medicine, commitment and professional expertise.(66)

Table 3'A' demonstrates how surgical appointments at metropolitan hospitals were restricted to internal candidates. More serious familial nepotism was by no means rare: when, in 1844, St.Thomas' Hospital Board considered a motion

"<t>hat no Governor be eligible to serve on the Grand or any other Committee who has near relations occupying places of trust or emolument or being aspirants to such places in the event of vacancies."(67)

it failed to be carried by the membership.

Such 'abuses' were widespread - a Pandora's box of professional evils and afflictions which would long

impair the social advance of the lowly hospital doctor. Failure to eliminate them fuelled the campaign for medical reform and provided a key element of the historical context in which claims to reorientate and restructure the medical profession around a cognitive basis supplied by 'science' were advanced as part of a wider strategy of usurpationary closure by which a new professional middle-class sought to discredit classical learning and inherited status as legitimate grounds for privilege, substituting instead, 'rational' criteria of technical competence and expertise.

As the editors of the Lancet insisted in 1849,

"<t>he efficiency of the medical body, in a humane and social point of view, depend<ed> upon the amount of professional knowledge possessed by its members. The greater that knowledge the greater <was> their value to society, the greater the amount of suffering and disease alleviated through their agency."(68)

By the term 'professional knowledge' was meant specific, objective, value-free knowledge directly applicable to medical practice, possible to acquire through training programmes, and, perhaps most importantly of all, capable of being assessed independently through 'impartial' tests obligatory for all aspiring medical practitioners to undergo.

This measured rationale for basing professional status (and appropriate material rewards) on utilitarian and 'scientific' grounds brought into sharp relief the invidious monopolistic philosophy and indifference to

the realities of medical and surgical practice emanating from the laudatores temporis acti who governed the Royal Colleges in London. The Lancet mercilessly lampooned the nescience and insouciance of that metropolitan elite who

"<had> discovered the most extraordinary ground for creating professional distinction that <had> ever entered into the mind of man. With them the chief qualification for eminence in the healing art <was> ignorance of one or the other half of it. A physician need not know much of physic; an entire ignorance of surgery <would> be sufficient to give him a respectable standing; a surgeon need not possess any real knowledge of surgery, but if he be sufficiently ignorant of physic - if he <did> not know the gout from the measles - that <would> render him 'pure' and make him eligible to receive the highest appointments; but a 'general practitioner' - a man who <was> so preposterous as to understand both physic and surgery - <was> fit only to become a 'subordinate'."(69)

In order to overcome the taint of subordinacy, the medical student was constantly enjoined by representatives of the rank-and-file practitioner to "earnestly strive to maintain and to elevate the social and political position of his profession."(70) From about the 1830s onwards, as the cultural nuances of the scientific 'Weltanschauung' became an increasingly accepted and socially valued element in the wider culture and vocabulary of the Victorian middle-class, aspiring doctors could more readily recognise the extent to which, as William Walshe informed his medical students in 1845,

"worldly interests <were> so directly promoted by the general dissemination of sound scientific doctrine that a peculiar

social influence <was beginning> to exhibit itself as the manifest result."(71)

The explicit espousal of scientific doctrine as a means whereby social influence might be promoted must be situated historically in relation to a community of medical personnel deeply divided in the early Victorian period over the proper performance of its occupational activities. Contending factions developed mutually antithetical ideologies centred around elitist legitimisation or meritocratic condemnation of monopoly. Monopoly Challenged.

From the perspective of general practitioners seeking more elevated professional status, monopoly demanded condemnation as a social, economic, and political evil per se (although we shall see that 'laissez-faire' rhetoric was quite compatible with the attempt to promote and justify a monopoly of practice excluding all categories of unqualified practitioner). It was intolerable to rank-and-file practitioners that the privileges conferred by monopoly should be enjoyed by an elite community whose scientific knowledge of medicine was defective. Reformers unequivocally condemned the "irresponsible few", located in the Royal Colleges, who were

"endeavouring to hold to themselves, as heretofore, an usurping and monopolising power, for their own selfish and exclusive interests, without regarding the best interests of the profession or public."(72)

These wider collective interests, from the standpoint

of those aspiring to become 'new' professionals, were intimately dependent on the advance of science and specific technical expertise.

Science, the Elite and the General Practitioner

It is important to clarify the role of particular configurations of knowledge in precipitating and maintaining intra-professional enmity and disputation during the period of medical reform, as the role of science in different strategies of professionalisation remains a controversial issue in recent scholarship. (72a) Was socio-political conflict between the medical and surgical elites and the rank-and-file general practitioner underwritten by and fought about the validity of clearly demarcated alternative forms of medical knowledge and therapeutic practice? Were socio-economic tensions between rival segments of the profession exacerbated by paradigmatic dissension over the legitimate basis of scientific medicine? Were specific forms of science and practice invoked either to legitimise or condemn monopolistic aspects of English medicine during this period?

The complexity and the heterogeneity of interest groups within the republic of English medicine and the proliferation of medical innovations - scientific, technological and therapeutic - render simple affirmative answers to these questions positively misleading. At the same time, however, different styles and traditions of medical science are identifiable and

co-existed during the reform period; and they were invoked selectively by spokesmen representing the interests of different fragments of the profession. Both the general significance of science in justifying or opposing elite privilege and monopoly, and the further issue of the specific form and content of the science invoked by the conflicting interest-groups must be examined.

If we focus first on the old elite of physicians - an increasingly narrow and reactionary minority whose 'raison d'etre' was progressively undermined by the expansion of general practice(72b) - there appears to be an almost total and sublime indifference to the claims of science understood as specific technical expertise. This attitude was epitomised by Sir Henry Halford, President of the RCS in 1834. Far more important than possession of occupationally relevant scientific knowledge, in Halford's view, was the physician's need "to adopt the sentiments and manners of a gentleman, by preferring such associates as are distinguished by their elevation of mind, their sound principles and their good manners."(72c) The ancient English universities were the only institutions fitting for the physician to acquire the edifying, uplifting and comprehensive course of instruction connoted by the term 'liberal education'. Correlatively, not the most recent texts in scientific medicine, but the long-hallowed classical texts of the ancients formed the bedrock of the physician's

education. Scientific instruction was assigned a subordinate place below good breeding and classical erudition: Halford advised the prospective physician that "those depositories of the wisdom of ancient days, which lure all men that are studious into that delicate and polished kind of learning, must be pored over night and day."(72d)

The scientific dimensions of medicine were further devalued and marginalised in comparison with the elite physician's view of medicine as a gentlemanly art. The physician needed to understand the structure of the human frame and the bodily functions in health and disease, but the sciences embodying such bio-medical knowledge were "but subsidiary instruments wherewith to execute, not to form, great designs."(72e) Those great designs, and the learned physician's ultimate goal, according to Halford, was the advancement of the 'art' of medicine sui generis - quite distinct from the aggregation of the basic and collateral sciences of life.

Halford, of course, represented an isolated minority of university-schooled physicians who dominated the Royal College and sought to perpetuate the tripartite professional structure and the formally-defined status appropriate to each estate despite the collapse, at the level of social action, of that structure and the emergence of a 'hybrid class' of general practitioner which included physicians themselves.(72f)

Physicians did not constitute a uniform class of practitioner, as we have seen evidence of the emergence of an alternative elite and of tensions between Fellows and Licentiates of the RCP towards the end of the eighteenth century.(72g) Halford's medical philosophy - in which the claims of the bio-medical sciences took second place to classics and medicine's customary art - nevertheless remains significant evidence of the elite view because of the disproportionate power wielded by the cabals who dominated the RCP. Such power was deployed to perpetuate an essentially pre-industrial conception of professionalism which shunned manual labour as degrading(72h), subordinated science to general culture and elevated 'status' concerns above the performance of occupational tasks within a 'rational' division of labour.(72i)

Later in the century, few physicians could endorse Halford's sublime indifference to, and marginalisation of, the relevance of the bio-medical sciences to medical education and professional practice, yet the elite cultural framework within which these issues were discussed remained - in its essentials - intact. The discourse of Henry Acland, a distinguished physician who was to revive scientific and medical education at the University of Oxford and become President of both the BMA and the GMC, illustrates this point. He defended and vigorously promoted the bio-medical sciences, especially physiology, yet within a context in which science was

only one part of liberal education and remained subordinate to the wider purpose of producing a medical profession of Christian gentlemen.(72j)

In his famous address on the relation of physiology and medicine delivered to the British Association in 1865, Acland enthusiastically embraced the 'incompromisingly precise' thrust of modern physiology based upon crucial tests of both extensive observation and experimentation.(72k) In its support, physiology drew upon mathematics, advanced physics, difficult chemistry and accurate and comprehensive anatomy; as such, the alleviation of human suffering and disease was critically dependent upon its progress. Yet Acland tempered his panegyric on the achievements of contemporary physiology with the customary circumspection of the elite clinician: the applied and observational aspects of medical education could only be acquired by the bedside of the sick. In Acland's view therefore, "pure Biological Science and pure Clinical Art must each have their votaries, but it must be the aim of each to learn from the other what is necessary for himself."(72l)

In common with the most proselytising of experimental physiologists who looked to the continent for exemplars, Acland celebrated the potential for certainty which the methodology of scientific experimentation offered the medical profession. "Experiment", Acland proclaimed, "properly applied in Medicine under trained physicists

and chemists <would> not only eliminate gradually all remaining error, but <would> make more definite the properties of therapeutical agents."(72m) Nevertheless, Acland remained suspicious of the cosmology of scientific naturalism: in the last analysis, his cognitive framework for the prosecution of medicine was underwritten by a clinical epistemology.

In his Presidential Address to the BMA in 1868, Acland again articulated an integrated, comprehensive medical philosophy which gave expression to elite concerns. He paid tribute to "the generally scientific spirit, and often the truly scientific method, with which the best men, such as Morgagni, Sydenham, and Hunter, observed and reasoned."(72n) Concrete exemplars of the 'progress' of medical science and practice were cited - Laennec's stethoscope extended the physician's discovery and explanation of physical and pathological phenomena; the optical instruments of Czermak disclosed hitherto inscrutable secrets of bodily organs; Helmholtz's ophthalmoscope and other physical contrivances embodied great advances in the science of optics; the idea of the conservation of energy gave doctors the power to revolutionise understanding of every conception of organic change. Yet Acland cautioned that the exigencies of medical practice and the emergencies daily encountered by the physician precluded him from reliance on the supposed 'certainties' of scientific medicine. Culturally too, Acland refrained

from endorsing the aggressive scientific imperialism of Huxley and his circle:

"When a man says there is in the present age of the world only one education provided by 'the Scientific Method', he seems to have forgotten the more general parts of our nature; the relations of man to man; and the more tender parts of our nature, sympathy with goodness, imagination, generosity, devotion. Are not these essential to the highest success in our profession, quite as much as the intellectual efforts of the more specially scientific observer?"(72o)

Like Halford before him, Acland insisted that medical education must ever remain a part of a 'liberal education' common to the professions and gentry of the nation, and that its object should be to produce a class of Viri Liberales imbued with the edifying values of the liberal sciences, in their moral and religious, as well as their technical, aspects. Like Halford too, Acland upheld the cultural conception of medicine as an erudite art whilst appropriating scientific and technical innovations for their therapeutic value. Both men cultivated medicine's sense of unity with wider general culture and stood steadfast against premature specialisation and the fragmentation of a common context of intellectual enquiry(72p). Further research, preferably of a prosopographical rather than a merely biographical kind, would be instructive.

Elite surgeons largely shared physicians' reverence for liberal education and cultured gentility, but their more practical orientation and their formal subordination to the order of physicians conduced to a less

circumscribed view of the relevance of the bio-medical sciences to medical education and practice.(72q) Elite surgeons invoked a particular conception of science bound up with the Hunterian tradition, but, as with physicians, it was valued as gentlemanly culture conducive to high social status as well as for its direct technical utility to the craft of surgery.

In 1745, the surgeons had formally severed their association with the barbers, and in 1800 the old Company became the Royal College of Surgeons of London.(72r) The historic project of the surgical elite was to draw cognitive boundaries around the activity of 'pure' surgery, gain and maintain professional parity with the order of gentleman physicians, and exclude the majority of surgeons engaging in general practice from the privileges the elite had gained. As with physicians, this project entailed preserving the established tripartite professional structure and denying representation to the majority of general practitioners.

In general, anatomy pursued in connexion with practical dissection was the surgeon's science 'par excellence' - important because surgeons could both use it to develop operative techniques and demonstrate that their professional skills were based upon an accepted, accredited body of knowledge. In 1838, G.T.Morgan, a lecturer on surgery, informed his students that scientific anatomy, viewed as "a knowledge of the structure and functions of every tissue and organ

throughout the body" formed the bedrock of the profession of surgery: it was "the key-stone ... which <bound> together its different branches - the parent-trunk around which they all entwine<d>."(72s) Anatomy, however, could not be studied profitably per se in isolation from its sister science of physiology: ideas of organ and function were so intimately associated that knowledge of one necessarily led to the other:

"Anatomy you understand to be the science of organisation; physiology that of life. The former teaches us the organs and textures of which the body is made up; the latter explains their use and the relation they bear in the economy of life."(72t)

Morgan epitomised the reigning assumptions of the dominant anatomical physiology of the period: the study of anatomical structure was the necessary foundation for an understanding of the physiological functions of the body. Similarly, Benjamin Brodie, in the same year argued that

"anatomy and physiology are one science and to teach them separately is about as absurd as it would be to divide astronomy into two sciences, the one teaching the figure and size of the heavenly bodies, and the other their motion."(72u)

Benjamin Brodie and other distinguished and influential members of the surgical elite such as Abernethy and Astley Cooper strongly defended the Hunterian legacy which gave priority to the derivation of physiological function from anatomical structure, and which had been reinforced in the early decades of the

nineteenth century by Xavier Bichat and his generation of French anatomists. Indeed, defence of the Hunterian tradition of comparative anatomy and physiology by the leaders of the surgical profession continued throughout the nineteenth century to such an extent that Hunter was the object of collective hero-worship and scientific iconolatry.(72v) Appeal to the intellectual qualities of the Hunterian legacy was the most frequently deployed resource in the project of justifying and legitimising the privileges and the monopolistic practices of the surgical elite.

In 1851, James Paget delivered a lecture at the RCS on anatomy's changing relation to surgery. Surgeons had always pursued anatomical studies in some shape or form, but recent developments heralded a stronger, inseparable relationship. Paget affirmed that there were "things in the recent progress of anatomy which it behove<d> every student of surgery to learn if he would either promote his art or practise with success." Paget typified the elite in his insistence that the utility of anatomy for surgery resided not in its technical facility, but in its capacity to strengthen the mind for the promotion of science: "<f>or truly none but the scientific mind <could> rightly use the means that <were> necessary for the promotion of such an art as ours; ... none other <could> maintain in itself that intellectual strength which <was> requisite in our emergencies."(72w)

Paget observed that the great John Hunter was

succeeded by a generation of able pupils - Cline, Astley Cooper, Abernethy, Blizard, Lynn - "who in their several schools taught surgery with the strength and clearness they had acquired in the study of the Hunterian physiology" and who had greatly increased the social status and worth of the surgical profession.(72x) As James Paget expressed it elsewhere, "the aristocracy of <his> profession <was> one of science" - honourable because founded on "the noble sciences" of the Hunterian tradition.(72y)

Hunter was revered both for rendering the surgical art 'truly scientific' and for establishing the foundations for a native tradition of comparative anatomy and physiology in Britain. George Macilwain, lecturing on the origin of local diseases in 1834, took a historical retrospect of the history of surgery and argued that before the arrival of the Hunters and Baron Haller, surgery "scarcely deserved the name of a science" as it was "chaotic; without form; and void of any order, which could afford a resting-place for the eye of Reason ..."(72z) Before the time of John Hunter, a knowledge of surgery consisted in little more than the recollection of a vast number of 'facts' of which neither the real importance nor true connexion was properly understood. It was reserved to the 'genius' of John Hunter, in Macilwain's view,

"to supply the light desired - to penetrate the dark void - and to elicit those splendid results which ... <had> rendered medical

science of all others, the most useful in diminishing the sum of human calamity, and <had> stamped it as such with the impress of his own immortality."(72aa)

The emphasis upon Hunter's intellectual stature qua scientist as well as his demonstration of the relevance of comparative anatomy and physiology to pathology and therapeutics was well suited to an elite of surgeons whose self conception was as the equal of elite gentleman-physicians, and his avowed purpose was to firmly differentiate surgery as a scientific profession from surgery as a craft or a trade.(72ab) One of Hunter's most distinguished followers and interpreters, John Abernethy, defended the Hunterian view of life in 1814 to argue:

"<t>hus <did> Hunter make surgery a science. It is the knowledge of health that enables us to understand the nature of disease. He connected pathology with physiology and it is impossible in future ever to disjoin them. He raised the solid and permanent pillar of physiology, and he placed surgery on the top where it must ever remain equal in rank and elevation to any other science, perhaps superior in utility to all."(72ac)

Abernethy acquired a formidable reputation as a lecturer and teacher of anatomical physiology on Hunterian principles. Use of the comparative method to elucidate general principles, and the focus on function and organisation had enabled Hunter to break away from eighteenth century natural history taxonomies (which classified on the basis of form rather than function): in Abernethy's view, this was precisely the basis of Hunter's revolutionising the science of surgery, and

these principles informed Abernethy's own teaching.

Later in the nineteenth century, Hunterian comparative anatomy became marginalised as insufficiently relevant to the practical imperatives of the medical student's curriculum, and was imperiously dismissed by Huxley as 'a science of yesterday'.(72ad) Yet in the early Victorian period, esoteric comparative anatomy was generously patronised and cultivated by the Council of the RCS. Its patronage reflected the preoccupation of elite surgeons with the corporation's image as a learned body of scholarly gentlemen, and with surgery as a 'science' in the fullest sense, embodying an imposing body of polite, cultured and formal knowledge.

That the surgical elite was animated more by the goal of enhancing prestige and social respectability than practical utility was abundantly clear in the course of lectures delivered by Richard Owen under the auspices of the RCS between 1837 and 1855. Owen, a major figure in British biology renowned for espousing an idealist but non-teleological morphology which owed much to the inspiration of German transcendentalism and romanticism(72ae), was made sole Hunterian professor of the RCS in 1837. Since 1813, when an annual oration in memory of John Hunter's contribution to medicine and surgery had been endowed, leading luminaries among the surgical profession had eulogised the Hunterian legacy - developing, as Jacyna has argued, a scientific

iconography which betrayed the polemical purposes of those who articulated it.(72af)

Those polemical purposes were unusually transparent in Owen's lectures on comparative anatomy, which incorporated the subjects of palaeontology and fossil osteology. The RCS's fulsome support for, and patronage of, its Hunterian Professor was part of its extensive investment - both intellectually and financially - in 'pure science'. Although Owen himself justified his comparative anatomical concerns, in terms of their importance for medically relevant sciences (on the grounds that "the anatomical structure of ... apparently insignificant and often little^known animals <was> often of the highest importance, and disclose<d> facts which <were> of the utmost utility in enabling us to understand the structure of the higher animals and the animal kingdom at large"(72ag)), he effectively narrowed the scope of the Hunterian legacy by focussing on more noetic and academic concerns, and RCS patronage had little to do with the relevance of Owen's lectures to pathology or therapeutics: 'clinical utility' does not account for the devotion of elite surgeons to the 'pure science' during this period.

Rupke has contended that the RCS's receptivity to Owen's academic paleontological and osteological interests as fitting subject-matter for the Hunterian oration was partly a response to the escalating competition the college encountered from metropolitan

hospital medical schools, but mainly part of a strategy for raising the social prestige of the profession by elevating academic standards and the intellectual credibility of surgery.(72ah) Wakley and the editors of the Lancet were contemptuous of Owen's paleontological work, urging him to devote his time and energy "in favour of Surgery";(72ai) but to the rulers of the Royal College, the Hunterian professor's lectures were exemplary, scholarly and gentlemanly scientific culture.

More research on both the medical and surgical elite would be necessary to sustain generalisations concerning the invocation of 'science' by leading physicians and surgeons during the first half of the nineteenth century. Nevertheless, available evidence does seem to suggest the following. For the elite among elite physicians, like Henry Hallford, science was not especially important as a legitimating ideology: secure in the enjoyment of a cultured, leisured lifestyle characteristic of pre-industrial elite society, science was largely peripheral. The physician's acquaintance with knowledge available in society was symbolic of status position rather than of utilitarian value. For elite surgeons too, the role of science was circumscribed, and professional learning was valued as general culture with an accepted social worth more than as specific and useful expertise. Yet the more practical nature of surgery and its formal subordinacy in the tripartite hierarchy gave elite surgeons greater call to

invoke science - albeit a certain conception of science and selectively - in support of social prestige and professional privilege.

Science and the General Practitioner.

We have seen that the medical and surgical elite tended to place more weight on social graces and general culture than upon medical knowledge and technical expertise, and it is tempting to see the burgeoning ranks of general practitioners in the early nineteenth century reversing this emphasis. The complexity and heterogeneity of interest groups among rank-and-file practitioners comprising the medical reform movement belie any such neat and tidy explanation. Nevertheless, it is clear that their subordinate social position, the threat of competition and the monopolistic practices of the Royal Colleges and hospital consultants gave general practitioners greater cause to espouse 'science' in the sense of universally valid, objective technical expertise directly applicable to the performance of occupationally-relevant tasks. Both the general role of science in furthering the general practitioners' professionalist strategy, and the narrower question of what particular conception of science or specific scientific disciplines were adduced, must be examined.

The general significance of the scientific 'Weltanschauung' in providing identity and a source of cultural self-esteem for upwardly mobile 'marginal men' is well known to historians, and it is reasonable to

count early nineteenth century general practitioners among their number.(72aj) Natural knowledge was important to those occupying ambiguous social positions both for legitimising their new roles in an emergent meritocratic and urban utilitarian order, and for delegitimising the 'unnatural' bases of the traditional social structure and the arbitrary privileges it conferred on the old elite. When Thomas Wakley, crusading editor of the *Lancet*, insisted that "<t>he medical man" by virtue of the nature of his profession "ought to be a scientific man"(72ak), he demonstrated his acute perception of the utility of espousing scientific culture to raising the status and prestige of the general practitioner.

As the very etymology of the term signifies, however, the general practitioners' knowledge-base was characterised first and foremost by its breadth, scope and comprehensiveness. Throughout our period, the general practitioner drew selectively upon the general body of medical, surgical, obstetric and pharmaceutical knowledge in its manifold scientific and technical aspects: discussions of the extent to which rank-and-file medical men drew upon 'science' in furtherance of a usurpationary anti-monopolistic professionalist strategy (and the particular sciences invoked) must be prefaced by this crucial observation. Indeed, it was the very breadth of the GP's knowledge and the great variety of skills and techniques he

possessed, which formed the main basis of his criticisms of the medical and surgical elite and the tripartite professional hierarchy which perpetuated the latter's injurious monopolies. In 1829, a member of the Metropolitan Society of General Practitioners affirmed:

"It is only the general practitioner who, when called upon, does not stop to inquire if the patient is inflicted with a 'surgical' or a 'medical' disorder; he feels himself doubly armed for either emergency and it is upon these grounds we take our stand ... The title of general practitioner is that, which, more than any other title, is descriptive of what we are ... and we want no other assumption to give us dignity."(72al)

Breaking down artificial boundaries between physic and surgery and maintaining a determined opposition to specialism were among the principal objectives of the medical reform movement. In 1823, the editors of the Lancet revealed how they were quite prepared to adopt the ideas of principal surgeons themselves in furtherance of reform, citing Astley Cooper on the importance of the study of medicine to surgery. The general practitioner "should be able to prescribe with certainty - should understand well, the great influence of local disease on the constitution, as well as the origin of local disease, from constitutional derangement."(72am) Without such knowledge, on the premises of Astley Cooper himself, any practitioner knew only half his duty. A "mere physician", the Lancet concluded, could not be a judge of surgical cases, and the two professions should mutually assist in the great

duty of preserving human existence.(72an)

The line of demarcation between physic and surgery was, the Lancet affirmed in 1826, 'unsettled, obscure and artificial', originating in "a period of barbarism and ignorance."(72ao) Medicine, understood as the science of disease in general, stood "one and indivisible" and could only be cultivated as a whole on the grounds that "<t>he disease of any particular organ <could> only be elucidated and successfully treated by those pathological principles which <were> deduced from a survey of the whole field of medical science."(72ap) Thus was articulated an integrated, coherent pre-specialist view of medicine qua science - a view in which medicine and surgery were united and in which priority was given to the medical as opposed to the manual part of surgery.(72aq) Vigorous opposition to the growth of special hospitals later in the century was underpinned by this macroscopic medical philosophy, and the general practitioner's dual qualification (LSA and MRCS) was its concrete embodiment.

Apart from the breadth of knowledge he possessed, a strong orientation towards utility and practical application characterised the general practitioner's scientific outlook. By virtue of the clinical work he performed and the utilitarian training he typically received in the first half of the nineteenth century, the general practitioner - unlike the elite leaders of the Royal Colleges - was largely unphilosophical and

practical-minded: in general, the usefulness of the knowledge and skills that science imparted was the measure of its scientific truth. The general practitioner placed increasingly greater emphasis on the performance of occupational tasks and medical work *per se* as opposed to the more traditional status aspects of the doctor's role: intra-professional conflict increasingly reflected the difference between these alternative bases of professional legitimation.(72ar) A different conception of the role, value and significance of scientific knowledge was implicitly at issue in disputes over rival claims to professional status.

Conflict with elite surgeons and physicians was typically expressed in condemnation of professional negligence, incompetence and ignorance of the present state of scientific knowledge relating to medicine and surgery. The editors of the *Lancet* declared in 1828 that the self-styled 'heads' of the profession were, in reality, at their 'tail' of it:

"They have, for the most part, obtained their situations through the influence of a corrupt system, and are decidedly worse informed, less conversant with pathology and therapeutics, less acquainted with the progress which medical science has made in other countries, and, consequently, less worthy of having the health and lives of the public confided to their care, than the majority of that respectable and enlightened class of practitioners, which they have insolently denominated 'a SUBORDINATE department of the profession'."(72as)

Many general practitioners liked to see themselves at least the equal - in skill, knowledge and scientific

accomplishments - of those who formally governed them(72at) and their leaders lost few opportunities to demonstrate the technical shortcomings of the eminent elite. Wakley made great play of Sir Astley Cooper's confession of ignorance, elicited during a trial in 1828, in which Cooper had been asked whether he was aware that the practice of surgeons in Paris and Edinburgh, having tried in vain to extract a stone from a patient's body, was to send him to bed. "I do not know of that practice", Cooper had responded. Wakley observed that the soundness of that practice had been witnessed by ancient and modern medical literati alike (citing Celsus, Franco, Calot, Tolet, Louis, Haller, Deschamps and Carpue among others), yet Sir Astley Cooper had sworn on oath that he had never heard of it! Wakley made further reference to abuses in hospital practice which had resulted in unnecessary mortality because operations had not been "scientifically performed". He concluded:

"The truth is ... that the highest degree of professional knowledge and skill, as well as the greatest amount of intelligence and activity, is to be found among that enlightened, though hitherto degraded class, which has been stigmatised by the corrupt few as a subordinate department of the profession." (72au)

Possession of a wide variety of skills and knowledge capable of being put into effective practice (rather than any particular branch of science) was here invoked to advance general practitioners' claims to professional equality with the elite - and this proved to be an

enduring strategy. Neophytes were constantly instructed that knowledge of several branches of science was absolutely imperative for effective practice and advancing the healing art. In 1853, the Lancet lampooned and satirised the overemphasis of some distinguished lecturers on the niceties and esoteric minutiae of scientific disciplines divorced from medical practice. It was too often forgotten, neophytes were advised, that a student

"is to become a future medical practitioner, not to render him as perfect as possible in a sort of technical legerdemain of test-tubes and microscopes. Too much time in anatomy is concerned with 'homologies' and 'developmental and transcendent anatomy', of bones accompanied by 'comparative illustrations' when nerves and vessels are neglected. In physiology, we see histology riding rampant and learned lucubrations on 'candate cells', 'epitheleal scales' and 'basement membranes' when time should be devoted to consideration of the laws of life, structure and action, or, in a word, function. The student lives in a world of invisible 'nuclei' and 'nucleoli'; homologies may be right, but knowledge of regional anatomy most useful in practice." (72av)

Each branch of medical science was caricatured in the same satirical way: chemistry was too often vitiated by an emphasis on the minutiae and subtleties of modern organic analysis and on the symbols and formulae of mere theoretic science rather than on more practical questions directly useful to future preservers of the public health; in the practice of physic, the library and its bookshelves should give way to the vitality of personal experience. (72aw) The Medical Times and Gazette

articulated a similar strongly practical ideology in 1858 complaining that too much of the general practitioners' education was focussed on 'verbiage': ars longa vita brevis meant the entire curriculum should be focussed on practical, professional concerns.(72ax)

Of course, the conception of science invoked by rank-and-file practitioners and their spokesmen in support of the socio-political objectives of medical reform was predominantly Baconian, and the emergence of neo-Baconian science in England in the early nineteenth century is of critical historical importance.(72ay)

Generally associated with the industrial revolution and the shift away from gentleman-amateur traditions towards a more technological conception of science which became part of an entrepreneurial capitalist ideology, neo-Baconianism had strong medical ramifications. The Baconian caption 'knowledge is power' applied as much to the upwardly mobile medical practitioner as to other groups of aspiring professional scientists and technologists; and the Baconian emphasis on empiricism and inductive reasoning proved attractive to rising social groups - like doctors - looking for a philosophy both relevant to their new positions and distinct from the reigning philosophical bases to social power and authority.(72az)

Delivering a lecture on the principles and practice of medicine in 1826, Dr.Ayre explicitly invoked the Baconian apophthegm and insisted on its universal

application: it was "as true in relation to the treatment of disease as to the exercise of political rule".(72ba) His students were advised to scorn mere book-knowledge and devote their energies to the practice of morbid dissection; instruction at the bedside was critical because most useful for practice.

Decades later, medical students were still inculcated with the same neo-Baconian prescriptions. Robert Barnes advised neophytes to patiently question Nature for themselves whenever an account of disease in one book was contradicted by another, and invoked the great authority of Bacon:

"It is difficult to reflect upon the progress and position of any Science without thinking of Bacon. In London and the provinces some score of addresses upon Medicine will be delivered today. I suppose that every one of them will contain some quotation from, or reference to, that great philosopher... Hear what he says of Science in general, and tell me if there is any department of human knowledge which more truly answers to his requisite than Medicine... For some men think that the gratification of curiosity is the end of knowledge; some, the love of fame; some, the pleasure of dispute; some, the necessity of supporting themselves by their knowledge. But the real use of all knowledge is this: that we should dedicate that reason, which was given us by God, to the use and advantage of man."(72bb)

No other profession than medicine consisted, Barnes believed, so simply in the pursuit of Truth and the Practice of Benevolence. For members of the lower branches of the medical profession practising in a society in which industrialisation

and associated 'modernising' processes had vastly swelled the demand for their services, Baconian philosophy meant that 'science' and 'improvement' were effectively synonymous and could be pursued to the benefit of both the profession itself and the populace at large. The increasingly popular view that the new world of innovation and machinery was a product of the application of 'science' spilled over into medicine and suggested how the professional interests of the general practitioner might be advanced.

The prosecution of these interests inevitably confronted the regular doctor with the invidious circumstances of the numerically tiny elite dominating the corporations whose power and authority appeared to have little to do with useful knowledge or its application to the benefit of man. Consequently intra-professional disputes between the rank-and-file general practitioner and the medical and surgical establishment revealed most clearly different conceptions of the value of science and the different uses to which it was put.

The basic thrust of the general practitioner's strategy was to invoke a strongly Baconian conception of science linked to demands for proper examination, qualification and licensing as a means of undermining the rationale for the traditional tripartite professional structure. The progress of medical science, general practitioners affirmed, made a nonsense of the

ranks and divisions between different branches of practice. Demands arose for a College of General Practitioners to cater exclusively for the educational requirements of the overwhelming majority of doctors practising medicine, surgery and midwifery.(72bc)

The project failed, but plans were drawn up to provide a comprehensive examination in all branches of medicine - anatomy, physiology, pathology, surgery, materia medica, semiology and the practical application of those facts and principles in the practice of medicine as empirically divided into medicine, surgery and midwifery. It was intended that all who passed such an examination should have the right to be called 'Doctor': the Lancet charged that the academic and medical attainment of many GPs were "immeasurably beyond those of hundreds of individuals who are now invested with that mark of distinction".(72bd)

Science was adduced in support of democratic political objectives: qualifications earned on the basis of merit were to take the place of inherited privilege in hospitals, colleges, and the medical corporations - reformers deeming it outrageous that hospitals were "controlled by men who <knew> nothing of medical science, and medical colleges...governed by individuals who <understood> no interests but those of their own pockets."(72be) Uniformity of education and qualification to the highest possible scientific standards was to be the instrument for the realisation

of such levelling, democratising goals in a still monopolistic republic of medicine.

Artificial distinctions of rank and title were to be erased and subordinated to meritocratic criteria: "i<t> <did> not much matter whether a physician be a Fellow or a Member of the College. It <was> enough if he was known to practise as a physician, and was able to maintain his claim to superior confidence by giving proof of greater scientific and professional acquirements."(72bf) In this socio-cognitive framework, representing the interests of the upwardly mobile lower branches of the medical profession, inherited status and close social connexions with the old ruling class ceded place to scientific expertise and the efficient performance of medical work as legitimate grounds for the exercise of professional authority: "<t>he only aristocracy, the only privileged class, which the profession or the public <would> tolerate <was> an aristocracy of talent."(72bg)

Having examined the social position of regular practitioners in early Victorian England and suggested that a particular conception of science - broadly Baconian, practical and utilitarian - did play some role in the campaign to attack the monopolistic practices of the Royal Colleges and consultant elites, and the medical reform movement generally, we must now consider the more concrete question as to what specifically comprised the knowledge-base of the general practitioner. Was there widespread acceptance of

specific scientific fields, and did the general practitioner invoke particular forms, styles and traditions of bio-medical investigation in support of an anti-monopolistic strategy?

We have already referred to a crucial caveat: rank-and-file doctors made much of their vocation as general practitioners and drew, in performance of their work, from a vast body of knowledge, skills and practices relating to medicine, surgery, midwifery and pharmacy. All the medical journals supplied the general practitioner with scientific and clinical information compiled from the recent lectures of experts, the publication of new texts at home and abroad, reports of thousands of hospital cases being treated in the metropolis, and accounts of the proceedings of the numerous medical and scientific societies which played such a conspicuous part in early nineteenth century provincial and metropolitan life.

The sheer, immense, almost encyclopaedic scope of the knowledge embodied in the medical journals is impressive. Just one issue of the *Lancet* in 1826 published hospital reports relating to fungus haematodes of the eye; a case of empyema in which upwards of two hundred ounces of pus were evacuated from the left side of the thorax; cancerous disease of the marima; the efficacy of iodine in bronchocele; a case of extensive fracture of the skull with depression of the bone unattended by symptoms of concussion of the brain; and

a case of strangulated inguinal hernia.(72bh)

Lectures were similarly macroscopic and comprehensive in covering all the branches of practice relevant to the regular doctor in connexion with his profession. In 1834, the *Lancet's* extensive readership was provided with lectures on the disease produced by the communication of flanders from horse to man; the means proper to render less frequent the crime of poisoning; fatal peritonitis; rhinoplastic operations and the reconstruction of the nose; the influence of the nerves in the development of the muscular system; the history, pathology and treatment of ringworm and scald-head; the anti-haemorrhagic effect of ipecacuana; the diagnosis of cases of aneurism of the arch of the aorta or of the innominata; human embryology; a post-mortem examination of His Royal Highness the Prince Don Augustus of Poland; the effects of the ethereal tincture of male fern buds in cases of worms in the intestines; the treatment of malignant cholera with strychnine; electro-chemical theory; petechial eruption of contagious fever; injuries of the abdomen; and intestinal convulsions, among others.(72bi) The orientation to practice stands out: the general practitioner, in the main, was an 'unphilosophical guy', probably uninterested in his elite lecturer's 'Weltanschauung', but receptive to his advice on how to treat patient's fractures and diseases.

Yet if the professional outlook of the general practitioner was wide-ranging and strongly oriented to

the utility of medical and surgical science in the Baconian sense, it is nevertheless possible to identify specific scientific fields to which he was particularly receptive. One such field was the popular science of phrenology. Elaborated by the successful Viennese physician, Franz Joseph Gall and popularised in Britain by J.F.Spurzheim and George Combe, phrenology was in many ways the Baconian science 'par excellence', seized upon by radical groups like the Chartists and Owenites in support of democratic, levelling socio-political goals during the first half of the nineteenth century.(72bj)

The basic thrust of phrenological doctrine was the claim that mental phenomena could be explained purely in terms of organic processes as revealed by the complementary sciences of neuro-anatomy and neuro-physiology. Combined with the critical postulate of topographical localisation of the brain, and rooted squarely within a naturalistic and empiricist methodological framework, phrenology both raised the spectre of materialism and held out the prospect of rational individual and social improvement.(72bk)

Phrenology, often in tandem with associated Benthamite ideology, became an important vehicle for radical, liberal reform in areas as diverse as education, penology and the management of the insane.

Few medical students could fail to be conversant with phrenological doctrine as it was enthusiastically

championed in most of the leading journals, publicised in medical texts, and lectured about in various institutions. From its establishment in 1823 to 1851, the *Lancet* devoted over six hundred pages to exposition and commentary on the subject, the bulk of it highly sympathetic and positively in favour of the 'beautiful and useful' science. Thomas Wakley, who was himself a member of the London Phrenological Society from 1824, published a full course of eighteen lectures on phrenology by Spurzheim in 1825, and another the following year by the French medical author, Francois Broussais. (72b1)

Given all we have seen of the general practitioner's orientation to practice, the appeal of phrenology is readily intelligible: its naturalistic ambience served to impugn the dominant metaphysical and religio-philosophical consciousness which tended to underpin the 'Weltanschauung' of the older elites; its undermining of the dichotomy between mind and matter, or body and mind, challenged and dethroned the Cartesian rationale for the existence of God; and its empirical content offered 'real' knowledge of the brain and its healthy and diseased functions. These aspects of phrenological doctrine together comprised an integrated, materialistic and fruitful science which conduced to the interests of marginal men such as the general practitioner in early Victorian England.

The Baconian rationale was frequently evoked by

medical spokesmen for the claims of phrenology in a stream of polemic aimed to convince the wider public and opponents of the immeasurable utility of the science. Gall was praised for "abandoning every theory and preconceived opinion, <giving> himself up entirely to the observation of nature" and for his "almost imperceptible induction." (72bm) A review of the Phrenological Journal in 1834 cited Gall's inversion of the Baconian precept "Man, the interpreter of nature" to "Nature, the interpreter of man" as a fitting motto for the medical phrenologists. A naively empiricist philosophy was adduced: "<p>hrenologists <could not> seek too widely or too assiduously for facts, nor enforce them too urgently when once discovered." The reviewers discerned "a willingness amongst the members of <the medical> profession to receive facts in this branch of science." (72bn)

A surgeon correspondent wrote to the Lancet in 1846 to defend the scientific credibility of phrenology against its detractors, alluding to "the fundamental principle whereby phrenology <had> been substantiated ... it was simply a deduction from matured observation of the brain, or of the forms which <had> been impressed upon the cranium by the cerebral mass." In pursuing his scientific observations, the surgeon believed, "Gall carried out the Baconian mode of philosophising: for he observed, and not till he had observed hundreds of cases did he declare his deductions to be sound." (72bo) This

cognitive framework resonated emphatically with the medical student's constant admonition by hospital teachers to devote his attention most assiduously to clinical cases at the bedside of the sick.

In 1832, John Elliotson, President of the London Phrenological Society, read a paper on 'the conversion of an anti-phrenologist' at the commencement of a new session. Elliotson had himself long lectured phrenologically on insanity at St. Thomas' Hospital basing his teaching on the texts of Gall and Spurzheim.(72bp) The paper in question was from an Italian, M. di Moscati, who had become a warm supporter of phrenology after a long period as a determined adversary. Moscati had recently consulted Spurzheim for a phrenological reading of his cranium and had been so impressed by an accurate prediction of a local and almost ocular memory and other mental qualities as to become a strong believer in the 'utility of truth' of phrenology:

"I became a phrenologist, ... and am convinced that mankind, through the well-applied scientific knowledge of phrenology may obtain the easiest method of improving the mind, of acquiring the sciences and the arts, of preventing the increase of evil passions, and of removing many, both natural and governmental, obstacles which are opposed to the much desired era of general civilisation and general happiness."(72bq)

Moscati's views neatly expressed the inter-relation of the scientific and socio-political dimensions of phrenology in the context of a Baconian emphasis on

observation, practicality and progress which could be used to demystify and break down the traditionally-constituted power structure. In a trenchant analysis of the 'social sense of brain' in the first half of the nineteenth century, Cooter has demonstrated that phrenology was indeed disproportionately popular among marginal social groups struggling to establish themselves and seeking to challenge the reigning assumptions on which society was organised.(72br) Of course, there were significant exceptions - both Sir Astley Cooper and William Lawrence numbered themselves as supporters of phrenology at some stage during their lives - but if we accept Cooter's argument that "what by and large distinguishe<d> those attracted to phrenology was a recently heightened sense of social worth being incommensurable with their place and power in the social process"(72bs), then we are bound to include general practitioners among them and see phrenology as a branch of science to which they were favourably disposed by virtue of their social position and occupational interests.

In 1824, giving expression to the increasingly popular theme of the value of science for medicine, the editors of the Lancet affirmed that there was not "a more important or valuable branch of Medical education than Chemistry ... It <was> justly regarded as the ground work of all medical knowledge..."(72bt) Like phrenology, chemistry may also be cited as a particular

science which played an increasingly significant role in the general practitioner's professional outlook. After Lavoisier's work on the chemical nature of respiration and on metabolism in the late eighteenth century, it became clear that chemical analysis might yield much valuable scientific knowledge about scientific processes and might therefore be of direct utility to medical practitioners.(72bu) A group mainly comprising medical men established an Animal Chemistry Club as an offshoot of the Royal Society in 1808(72bv); and a group whose interest in medical chemistry was related to sanitarian and public health problems gradually came to dominate the Royal Institution, displacing the older 'gentleman-amateur' ideology of science.(72bw)

As with phrenology, the Baconian orientation and practical utility of chemistry was the key to its receptivity and support among medical men. "In our times" according to the editors of the Lancet in 1824,

"the great value of chemistry to medical practice is every day proved by the success which attends a just application of its principles, whether adopted for the purpose of discovering the cause of disease, or of prescribing remedies for its cure. It is, therefore, now justly regarded as the ground-work of all medical knowledge, and it is also indispensably a most important part of surgical education; for chemistry alone is the only key to physiological investigation ... The real importance of this science, as it now exists, is not only felt in every branch of the medical profession, but is observed to extend its influence to every class of society, hoisting its banners in every country, and rapidly enlisting active supporters in the common cause of useful knowledge."(72bx)

Such claims were purely rhetorical as the value of chemistry to therapeutics or public health was virtually non-existent at that time; but the perception, rather than the actuality was the critical factor here, and the science of chemistry provided the 'improving physician' with further technical expertise of potential application to a variety of his professional tasks. The scientific ideas of Magendie, Pelletier and, most of all, Liebig gave aspiring professional medical men a means of adopting the mantle of science and putting it to medical, pharmaceutical, industrial and public health uses.(72by) As Berman has argued:

"Science did not contribute to medicine at this time any more than it contributed to agricultural innovation in the eighteenth century. It was rather an ideological instrument used by medical and agricultural groups and ... became organised as a by-product of <the> social changes <of the industrial revolution>."(72bz)

The invocation of a science such as practical chemistry by reform minded improving medical Benthamites - Henry Warburton, John Bostock and Augustus Bozzi and W.T.Brande, for example(72ca) - in part conduced to the interests of the general practitioner, who, in a vastly overcrowded profession, sought remunerative employment not only in medicine but in adjacent fields like pharmacy, public health, poor law administration and other governmental agencies. Yet far more empirical research must be undertaken before the historian can

accurately assess the role of chemistry, just one science, in a professionalist strategy which involved political organisation, claims to the social status of middle-class gentlemen and changing patterns of demand for health services as well as doctors' possession of 'scientific' knowledge and expertise.(72cb)

We will conclude our discussion of the rival conceptions of science invoked by the medical and surgical elite and the rank-and-file general practitioner with some observations on one interesting episode in the history of the Hunterian Orations. As we saw earlier, these orations tended to serve polemical purposes related to elite surgeons' claims, on intellectual grounds, to professional parity with physicians. In 1846, William Lawrence's oration revealed how such purposes could be combined with an uncompromising attack on the 'subordinate' ranks of the surgical profession - an attack in which an appeal to the culture of science served at once to legitimise elite privileges and impugn the merit and credentials of the rank-and-file.

Lawrence is well known for his debate with Abernethy over the vital principle's relation to life. Lawrence's espousal of a proto-materialist biology incurred charges of dangerous irreligion and radicalism in the repressive climate of the French revolutionary war and its aftermath; and he was forced to retract his views.(72cc)

To the chagrin and indignation of Wakley and other medical Benthamites, Lawrence later abrogated his radical views.

On the 14th February 1846, Lawrence used the Hunterian Oration to mount an aggressively conservative defence of the Council of the RCS which had been charged with cancelling the annual occasion out of fear to meet its members. Prefacing his lecture with remarks about the present profession's "vexed and disturbed ... agitation and clamour for what is called reform", Lawrence branded the radicals' charge as a "foul calumny", defending the Council which had "never deemed so unworthily of its members as to suppose that they could entertain the intention of profaning this sanctuary of science by vulgar brawl and clamour, fit only for the hustings or the tavern."(72cd) The Council, he affirmed, would always discharge its 'sacred purpose' of paying tribute to Hunter who had so honoured the profession and so exalted the 'scientific character' of the country.

Lawrence proceeded in an uncompromisingly ex cathedra manner to attack rank-and-file practitioners' demands for incorporating a Royal College of General Practitioners to be endowed by the legislature with extensive powers.(72ce) Lawrence effectively turned tables on the general practitioners and applied their own arguments about science against themselves. As to

the idea of establishing an institution for the advancement of learning and the promotion of medical science, Lawrence contemptuously and derisively demanded:

"Who ... <were> the learned and scientific persons that <were> to constitute this new College? And what branches of science and learning <were> they to cultivate? ... They who presume<d> to undertake so high a mission should be able to produce some evidence to show that they possessed the scientific qualifications necessary for so arduous an undertaking." (72cf)

Lawrence's opposition to proposals to establish a Royal College of General Practitioners was founded on a staunch defence of the continuing viability of the established tripartite professional order, notwithstanding the clear de facto bipartite line of division within the profession between consultants and general practitioners. According to Lawrence, the threefold division had "arisen in the progress of society, was recognised by law, and was authorised by general approbation and consent." He believed the public knew pretty well what was meant by a physician, surgeon or an apothecary and would be sorely puzzled when they came to deal with a 'general practitioner'. Lawrence's gnostic disdain for the banausic preoccupations of the lower medical orders culminated in a contemptuous dismissal of the capacity of the Society of Apothecaries to carry out its duty, after the Act of 1815, of examining in the various branches of medical science.

The Society had performed the duty "as well as they could be expected to", but the Council of the RCS could not shut its eyes to the fact that "the interests of science required that they should be freed from duties which ought never to have been imposed upon them."(72cg) Unlike apothecaries and the lower ranks of surgeons, John Hunter possessed a 'superior mind' and his scientific accomplishments had been "raised, by the conception of a grand idea, above the interests and cares of the moment."(72ch)

Wakley and the Lancet were outraged at Lawrence's scandalous and malicious attack on ordinary members of the College, lambasting the President, Mr Samuel Cooper, as a worthless and unprincipled man for failing to publicly repudiate Lawrence's calumnies. Members were instructed to cut off official intercourse with the Council in protest, and editorials demanded Lawrence's retirement from professional life. Members of the College had been rewarded for their scientific labours by being "charged with ignorance, with incapacity, with not being surgeons.(72ci)

The dispute can be seen to express conflicting views about the propriety of the established professional order, and, ceteris paribus rival conceptions of the function and legitimacy of scientific knowledge. The general practitioner in the

early nineteenth century increasingly recognised that the tripartite division of labour actually militated against the full employment and utilisation of the general body of medical knowledge and skills which had developed during the period; elite physicians and surgeons, however, remained committed to a pre-industrial professional hierarchy of rank and status.

The general practitioner challenged the traditional hierarchy on the grounds that it did not conduce to the most effective performance of medical work in all branches of practice, and merely served the function of perpetuating outmoded status distinctions. Where senior physicians and surgeons seemed obsessed with the maintenance of traditional and social divisions, the general practitioner - under the general banner of 'improvement' and reform - presented himself as the most efficient and productive part of the profession. As one contemporary observed in 1830, the

"General Practitioner seems to me to possess that sort of superiority when compared to the exclusive Physician, which common sense always allows to the practical in preference to the theoretical part of any science whatever." (72cj)

Here resides the essential key to the question of 'science' and the professionalisation of the general practitioner. Although certain forms of scientific knowledge, such as phrenology and chemistry, were of

disproportionate significance given the social position of the general practitioner as a marginal man, it is the strongly Baconian and utilitarian conception of science in relation to the entire spectrum of medical practice that distinguishes the rank-and-file practitioner most sharply from the old elite. We have seen that both Wakley and the radicals on the one hand, and Lawrence and the Hunterian Orators on the other, could draw upon science as a resource, but it was invoked in support of what Elliott has identified as two basic alternative modes of professionalism centred around 'status' or 'occupational' concerns.(72ck) The general practitioner sought to erect claims for professional autonomy on the basis of specialised but wide-ranging occupational skills and science directly useful to the performance of medical work; the elite clung to an older form of legitimation which could draw on science as polite culture but stressed mainly 'extra-scientific' qualities such as breadth of erudition, literary tastes and gentlemanly virtues - qualities which endured as elite legitimation in one form or another throughout the nineteenth century.(72cl) Here resides a basis for intra-professional conflict over the sciences related to medicine, but far more empirical research will be necessary to firmly establish the potential value to

the historian of this heuristic framework.

The Evils of Monopoly.

Between 1830 and 1850, English history was rich in movements - of variegated political complexions - for radical social reform. These decades witnessed philosophical radicals, Cobdenites, the Anti-Corn Law League and Manchester businessmen vigorously campaigning, albeit from different standpoints, against monopoly and restrictive practices in the sphere of trade and commerce.(73) That such autochthonous relics of the 'old corruption' of Georgian England still survived, largely unadulterated, in the world of Victorian medicine was, a fortiori, an intolerable affront to Wakley and the medical Benthamites.

D.O.Edwards, another of their number, published a series of articles in 1841 that were much discussed among the medical profession. His 'leitmotifs' were sounded in the name of the pristine applicability of political economy and 'laissez-faire' principles to the organisation of medical practice.(74) The intolerable circumstances under which the hard-working and ill-rewarded general practitioner laboured were, in Edwards' estimation, attributable in the last analysis to "the bonds and shackles which monopoly had forged."(75) The impact of the operation of the same had been "to impede and smother" enterprise in medical practice, and consequently to "shackle the free agency

and lessen the usefulness of the medical man."(76)

Edwards' conviction was that "the mainspring of everything great or useful in medicine and its collateral arts, <was> and ever <had> been private enterprise." The policy prescriptions of this author's unambiguous predilection for liberalism and 'laissez-faire' individualism were clearly expressed in the view "that no restraint ought to be placed on the liberty of the subject which is not clearly and unequivocally conducive to the public benefit." "From this principle," Edwards concluded in Benthamite tones, "it is deducible that that government is the best which attains its object with the fewest restrictions."(77)

The overall purpose of the entire series of these articles was to suggest, with an eye pointed directly at the Royal Colleges, that liberal political principles ought to be applied directly to the government of the medical profession in Victorian England.(78)

The emphasis of sections of the medical reform movement on the inherent evils of monopoly and their deleterious social consequences needs to be underlined as it runs counter to the received wisdom of some sociologists of the professions that the historical dynamic of professional development is the systematic drive to monopolise the market for the supply of professional (medical) services. Berlant, although quite legitimately insisting that the trajectory of professional evolution is intelligible in terms of

patterns and structures rather than "coincidences of history"(79) errs in overestimating the extent to which English doctors pursued a monopolistic strategy in the first half of the nineteenth century. He consequently tends to overlook certain elements of congruity between professionalism and market values in the mistaken assumption that "the medical profession's political condition did not correspond well with developing bourgeois ideologies."(80)

The zeal and forcefulness with which radical medical reformers assailed the invidious monopolies, restrictive bye-laws and flagrant nepotism of the metropolitan medical and surgical elites indicates that Berlant's posited antithesis between bourgeois and professional values is only a partial truth. Nor can the complexity of the history of the reform movement be accurately characterised in terms of Berlant's

"history of the ideological reformation of the profession to preserve privileges both internally and with respect to the larger society in the face of the levelling forces of liberalism and egalitarianism."(81)

It may be naive to accept expressions of egalitarian sentiment on the part of doctors of the period at their prima facie value, but it is equally misleading to dismiss the radical utterances of Wakley and his sympathisers as "false consciousness". The demand for a 'single portal' of entry into the profession was part of a levelling strategy which entailed the complete abrogation of the tripartite professional order.

Larson's generalised reflections on the medical profession's "exceptional and unparalleled capacity for monopolistic control"(82) over the expansive market for medical services, despite much sociological acuity, gloss over and circumscribe the saliency of distinct occupational interests within the community of medical practitioners, and the differential degree to which each fragment of the wider profession articulated monopolistic values to determinate ends.

Webster, in a trenchant sociological analysis of socio-cognitive metonymy in relation to the professionalising strategies of English doctors, has drawn attention to the way in which educational institutions were established and transformed in order to "monopolise control over the production of medical knowledge as a saleable commodity."(83) Medical schools have certainly proved, in different societies and periods, to be critical to the success of marginal groups in securing social acceptance and recognition from a general public long sceptical of doctors' claims to professional competence on the basis of scientific expertise.(84) Nevertheless, this judgement gives insufficient credence to the rejection by radical reformers on clearly-formulated, liberal 'laissez-faire' grounds, of long-standing monopolistic restrictions perceived to "cabin, crib and confine"(85) the profession to the detriment of the overwhelming majority of Victorian practitioners.

Parry and Parry, in their studies of the collective social mobility of the medical profession, also portray the registration movement before the Medical Act as an integral aspect of a wider professionalist strategy. In their view, the campaign for medical registration was, at bottom, about securing and maintaining for practitioners "a degree of monopoly with respect to the provision of particular types of services in the market place." (86) In common with the explanations cited above, this contention is premised on the doubtful assumption that there was a homogeneous medical profession with a common interest in pursuing a uniform strategy to monopolise the market for medical care via a campaign for registration. The critical problem for these theoretical frameworks - and the key to understanding their limitations - is their failure to illumine the historical significance of some important episodes in the protracted campaign for medical reform. After all, among medical Benthamites' reforming prescriptions were: ensuring strict uniformity of examination and qualification by establishing a new college to examine all entrants to the profession; establishing a medical register of all qualified practitioners; and securing reciprocity of practice throughout the United Kingdom by the systematic abolition of local privileges and jurisdictions enjoyed, for centuries, by the ancient medical corporations. (87)

It is necessary neither for the militant faction

canvassing for these demands to constitute a majority among the reformers, nor for the successful legislative enactment of their objectives (for neither of these conditions obtained) to grasp how uneasily an exclusive preoccupation with monopolisation squares with the historical experience of English medical reform movements. If the three formal branches of the medical profession before 1858 were presenting "a united front to the rest of society"(88) in an attempt to establish a monopolistic dominion over the medical market, it was a front frequently punctured by internecine strife.

Monopoly Legitimised.

However, it would be thoroughly misleading to conclude from these observations that monopolisation as such was alien to the early Victorian medical reform movement. In dealing with external competitors who threatened to hinder that professionalism whose realisation was the ultimate objective of Wakley and the radicals, monopolistic arguments were not only advanced to contain quackery, but were put forward as universalisable principles on which professionalism might ever be based. These monopolistic dimensions of the campaign were incompatible with the pristine political prescriptions of classical liberalism; they entailed compromise with the market-centred vision of society beloved of political economists and their epigones.(89)

Ideologists of the radical wing of the medical reform

movement sought to portray medicine as a special case, exempt from the universal sway of 'laissez-faire' principles. William Cullen once wrote to Adam Smith himself to argue that, so far as medicine was concerned, "none of the reasons for unfettered competition <were> of any force." (90) This was the ideological standpoint adopted by professionalising doctors as their point of departure. They articulated a doctrine of 'patient dependence' to justify the abandonment of the hallowed liberal principle of non-intervention by the state.

In devising a monopolisation strategy, regular doctors suggested that there was an alternative context in which the culture of 'science' was evoked for the social cachet it might purchase and the benefits it might confer.

The underinvestment of resources in support of medical education, its mismanagement by an aloof and indifferent elite, the inadequacy of qualification and the absence of proper evidence of qualification were constantly decried by spokesmen for the interests of the general practitioner. Yet the vigour of the reform movement stemmed not only from resentment of the consultant elite's unjustified privileges; for general practitioners' aggressive belligerency was also directed at a more numerous group than the cabals controlling the Royal Colleges or the incumbents of lucrative posts in the voluntary hospitals. As the first issue of the *Lancet* made unambiguously clear, regular doctors

reserved their utmost contempt for "the impositions of ignorant practitioners"(91) - a somewhat nebulous and ill-defined group whose apparent ubiquity and success often united disparate strands within the reform movement. Professional solidarity was demonstrated in the name of 'legitimate' medicine.

The Problem of 'Quackery' for an 'Overcrowded' Profession.

'Quacks', as irregular practitioners were commonly and pejoratively labelled by their self-styled 'regular' competitors, included a complex and bewildering variety of alternative healers - 'folk' practitioners, herbalists, faith healers, homeopaths, occultists and dispensers of all manner of ingenious and by no means always ineffective remedies.(92) From the perspective of those seeking to accomplish a recognised 'profession' of regular, orthodox and 'scientific' practitioners, what such alternative healers shared in common was the non-possession of proper qualifications or licenses. Regular doctors took their stand on the need to establish uniform training through a national system of licensure that would effectively eliminate irregular practice by the enforcement of legally prescribed penalties.(93)

The legitimate medical profession, radicals contended, was utterly discredited by having no competent authority to guard entrance to it, nor to enforce acceptable standards of qualification. There was

a great want, they reasoned, of some kind of presiding influence to ensure professional standards by establishing a regular system of professional education to equip members with a recognised body of knowledge. Such reasoning spurred Thomas Wakley, arch-enemy of quackery, to enter Parliament, represent the interests of 'regular' practitioners, and press directly for reform.(94)

To understand the vilification and venomous polemic directed against the 'quack' or mountebank, fuller consideration is demanded of general practitioners' grievances before 1858, their perception of the origin of their plight, and their hypothesised solutions to professional dilemmas. Their complaints were largely a consequence of their ambivalent structural position - assailed from two fronts, by an unrepresentative, over-privileged elite on the one side, and by an army of rude, illiterate and (so they liked to think) 'empirical' practitioners on the other. The central paradox of the reform movement was that its activities were premised on assumptions at once monopolistic and anti-monopolistic. Its anti-monopolistic dimensions derived from common consciousness of unjustified subordination to an elite whose privileges stemmed from the survival of the rankest corruption and nepotism.

Modern historians have quite properly reacted against over-simplified, monocausal explanations which reduce historical complexity to overriding causes - such as the

primacy of economic forces - presumed to act as a deus ex machina standing outside, over or above the stream of history. Nevertheless, it is remarkable how much economic considerations did influence general practitioners' attitudes to external competitors and their political values.

Earlier we saw how modest was the remuneration earned by the typical early Victorian doctor, but argued that economic resentment was not the primary engine driving rank-and-file doctors' opposition to the Royal Colleges. However, economic discontent did fuel the fires of regular doctors' attempts to outlaw and proscribe all forms of unlicensed and unqualified practice. 'Quacks' vied with orthodox doctors in meeting the demand for medical services; the incomes of the latter were directly affected by the degree of competition they faced within the locality from the former.(95)

General practitioners themselves believed that their economic difficulties were the consequence of the 'overcrowding' within the profession. In 1834 it was estimated that England and Wales possessed between twelve thousand and fourteen thousand general practitioners out of a total population of approximately fourteen million.(96) If this estimate were correct, there would have been one general practitioner for approximately every thousand of the population; but this figure overestimates the number of people able to pay regular doctors for their services.(97) It was a highly

competitive market in which incomes were unstable and frequently fluctuating, especially in provincial practice.

The expense of medical education (costing an average of between £500 and £1,000 for an apprenticeship, fees, board and lodgings etc.) and the risk involved in investing the capital necessary to establish a viable practice, meant that economic grievances were inevitably voiced. In a publication written to advise the burgeoning middle-classes, increasingly ambitious for their sons to acquire professional status, J.C.Hudson warned in 1842, that there was "no profession in which it <was> so difficult to make a beginning as in that of medicine", and that there was "but too much truth in the vulgar saying that by the time when a physician earns bread and cheese he has no longer any teeth to eat them with."(98) Income was crucial to social status, a critical factor making for the respect of the wider public, and also had bearing on the degree of professional autonomy enjoyed by the practitioner.

Doctors' economic pessimism had wide-ranging implications and consequences. These were recognised by the editors of the Lancet in 1827 in an article bemoaning the inferior professional status and rewards of the doctor in comparison with his counterpart in the church and the law;

"<t>he church has its bishops, with diocesses <sic> of enormous revenues, and its thousands of fat rectors, with

their rich rectories. The law has its chancellors, vice-chancellors, judges, attorneys and solicitors-general, colonial-judges, and their subordinate officers, masters in chancery, police-magistrates, commissioners of bankrupts, and many others too numerous to mention. Such is the ample reward which await those who may distinguish themselves in the church or in the law; whilst in medicine, the height of a man's ambition is to be appointed either as a physician or surgeon to a hospital, with a salary of forty pounds a year; or to receive a similar appointment at an infirmary or dispensary, without any salary at all. Thus situated it is not surprising the mass of the public should view the profession of the law and that of the church with a more respectful eye than that of physic, because wealth and patronage were two public sources of deference."(99)

Nor were general practitioners' ailments much alleviated, as might have been expected, by the legislation of 1834 which represented a significant climacteric in the history of medical reform. The New Poor Law affected the daily lives of ordinary doctors more substantially than the Reform Act, two years its predecessor, and also proved more decisive in fostering professional consciousness out of common outrage at the economic ills its enactment brought with it.(100) The wider socio-economic origins of the New Poor Law of 1834 are beyond the scope of the present enquiry, except to note that this legislation was the product of a qualitatively new mode of government action, described by John Simon himself as "the first step in the modern utilisation of medicine by the State."(101) The most notorious provision of the legislation of 1834

established a system of competitive bidding for the appointment of medical officers of the Poor Law Unions. During the late 1830s and 1840s radical reformers launched a vigorous campaign to force the repeal of the offending clause.

Edwin Chadwick, architect of the legislation (whose bureaucratic tendencies and utter contempt for the general practitioner provoked Wakley's most embittered opposition) together with Assistant Commissioners of the Board sought to fill contract positions by public advertisement for the lowest possible tender. Poor Law doctors suffered economically, sometimes securing contracts for Unions for as little as £11 or £12 per annum.(102) To the professional damage inevitably inflicted by such miserly remuneration, was added the injury caused by reinforcing the public image of the doctor as a mere tradesman or sordid purveyor of the medical commodity. Engaging in ruthless market competition with fellow practitioners took place in a period when it was critical to impress the public with the superiority of the regular licensed doctor over 'quacks' and 'charlatans'. The economic arrangements of the New Poor Law thus ultimately had the effect of undermining the social standing of the general practitioner, whilst doing nothing to alleviate his financial difficulties.(103)

In 1841 the Lancet put forward three uncompromising demands which epitomised the interests of the general

practitioner in medical reform: first, the supersession of existing corporate bodies by a single medical organisation which would register all medical practitioners, and administer a qualifying examination to all candidates; second, the standardisation of medical education; and third, the imposition of criminal sanctions against unlicensed practitioners.(104) The interdependence of these demands must again be emphasised. Aggressive opposition against quacks derived, in large part, from resentment at the commercial success of so-called healers who had neither received nor paid for any formal medical training. Advocacy of a national register, in turn, was a collective strategy for eliminating competition from the ignorant and uneducated on 'rational' grounds and in terms calculated to appeal to the 'public interest'.

Canvassing public support for these radical objectives (none of which was to be implemented in the legislation of 1858) the *Lancet* continued to bewail the deleterious consequences of an overcrowded profession. "It is admitted on all hands", declared the editors in 1842,

"that many of the evils under which the medical profession now labours are owing to the teeming multitude of practitioners. This necessarily involves an impoverished state of the profession, and has, doubtless, contributed largely to that depression of intellect and morals amongst its members ... The means of restraining this superfluity of doctors, and rendering the number of the profession more proportionate to the population, became, therefore, very

important objects of medical legislation."(105)

By imposing a high standard of qualification, it would be possible to restrict entry to the medical profession to the mutual benefit of practitioners and the public welfare.

The following year, the editors reiterated the claim that great injuries were being inflicted on industrious practitioners by the overcrowding of the profession in a way that more clearly revealed the economic basis of the discontent. The profession was undoubtedly "overstocked", affirmed the Lancet, "with a superabundance of unqualified men, mere speculators in drugs and chemicals", with the result that "educated practitioners <were being> deprived of their legitimate means of obtaining a subsistence."(106) The practitioners on whose behalf the Lancet campaigned were members of a liberal profession rather than a mere trade: the financial rewards earned by professionals were legitimate; those accumulated through unscrupulous trading or self-interested private entrepreneurship were emphatically not.

The conception of medical education evoked in such utterances was, at bottom, economic and utilitarian. Medical training was an investment of resources, in exchange for which the investor sought profit that was proper and legitimate because earned by 'professional' labour of service to the general public and community at

large. By contrast, the quack or mountebank received no education in the principles of medicine whatever, and ipso facto was an ignorant banausic with no right to practise medicine, nor to amass professional rewards. One contributor to the Lancet put the matter succinctly in 1841;

"no person should risk the expenditure of time, labour and money necessary to the attainment of his qualification of license to practise, unless he felt himself to be effectually guarded by the laws against the competition of unlicensed and ignorant, though impudent and plausible empirics."(107)

This commentator was confronted by one of the principal difficulties of the orthodox practitioner which long fettered and shackled, thwarted and frustrated his Promethean efforts to raise his status and rewards, and to emulate the professional success of his elite superiors. This was the persistent therapeutic barrenness of scientific medicine during the first half of the nineteenth century. The hollowness of doctors' claims to professional privileges in exchange for professional expertise solidly anchored on the bedrock of science was evident to a population suffering, by the early Victorian years, not only from epidemics of long standing, but also from a new range of diseases whose ultimate origins lay in industrial society itself.(108) In 1832, for example, a serious cholera epidemic reached the shores of Britain, killing more than 21,000 people in England alone.

The medical profession was utterly baffled, perplexed, virtually mystified by the outbreak of cholera. The populace were given no reason to believe that conflicting scientific theories emanating from the medical profession as regards the aetiology of the disease had any more plausibility than the claim advanced by some members of the clergy that cholera was a visitation from above, a message of divine retribution.(109) At the outbreak of the epidemic in 1832, medical science was clearly in a pre-paradigmatic stage of evolution: scientific ideas about its cause and significance had no more necessarily coercive force than moral or metaphysical explanations.(110) As the Annual Register for 1832 recorded with understandable regret,

"<t>he cholera left medical men as it found them - confirmed in most opposite opinions or in total ignorance as to its nature, its cure and the cause of its origin, if endemic - or the mode of transmission, if it were infectious."(111)

One historian has argued that the strength of traditional medical education in the old pathologies underwrote the medical profession's resistance to adopting the 'cure' for cholera (developed by Thomas Latta of Leith, Edinburgh) and the patent inability of the same to comprehend or arrest the orphic visitation of the epidemic in 1832.(112) Whatever the cause, the effect of the profession's impotence was to undermine the efforts of those seeking to raise the status of regular general practitioners, to reinforce and confirm

the contempt of laymen such as Edwin Chadwick for organised medicine and its personnel.(113)

'Merit' and 'ability', as opposed to birth or inherited privilege on the one hand, or cheapness on the other, were the ideological watchwords and rallying-cries of rank-and-file regular practitioners seeking to raise their professional standing. One significant means of advancing such an objective was to draw cognitive boundaries around a particular body of knowledge, and claim that its exclusive possession guaranteed the optimum performance of socially necessary functions. One surgeon, G.T.Morgan, declared in 1838 that medicine was no longer "a mere science of speculation, displaying the wildest flights of the imagination, the grossest absurdities and the most illegitimate reasoning", but had become "a science of facts and just theory, resting on the sound basis of improved anatomical knowledge and legitimate experiment."(114)

Medical science was just such a body of knowledge - yet doctors remained in a "degraded state", which Morgan attributed to society's neglect of science. He doubtless spoke for many regular practitioners when he complained,

"<w>e see the humble and unpretending man of science despised, neglected, and left to struggle with the iron hand of poverty, while the daring and shameless impostor is not only allowed to rear his head, but is welcomed and flattered and admitted to the enjoyment of every artificial distinction which wealth and rank and ignorance can together confer."

Morgan predicted that in the future "the road to fame"

would be opened up; merit would receive "its due reward"; science would "prosper"; and mankind would "reap the benefit".(115) Yet these desiderata would assuredly await the distant future so long as the public continued to be presented with the spectacle of internal dissension and conflict, inconclusive debates over the aetiology of illness, and the therapeutic barrenness of officially prescribed remedial techniques.(116)

This is not to make the whiggish point that 'inadequate' or 'unscientific' therapeutics hindered the professional emancipation of medical men; as it is quite plausible to argue that 'primitive' healing modalities such as venesection or the application leeches really did 'work', or at least fulfil some therapeutic function, when situated in their proper socio-historical context. Nor is this position intended to identify scientific medicine straightforwardly with therapeutic efficacy. Rather, it is to make a sociological point about the critical importance of how groups of people perceived the work of Victorian doctors.

By the early Victorian period, engineers could point to an effective railway system as evidence of the utilitarian value and practical success of science. Doctors were scarcely at that time in an analogous position.(117) Unless the licensed practitioner could demonstrate that the services he provided and the knowledge and techniques he drew upon in the performance

of his occupational tasks were in some sense 'superior' to the products quacks sold on the open market, his professional pretensions would remain potentially open to public ridicule. For what was the good, a suffering patient might have asked, of a long and expensive medical education - whether theoretical and classical or practical and utilitarian - if it did nothing to relieve him of his ailments? So far as more mundane medical complaints were concerned, and for all the stress of 'scientific' doctors on the authority vested in their expertise and special knowledge, there was frequently little to choose - except, perhaps, for the price - between 'quack' or 'professional' treatments.

Professional Deviants

The historical development of medical knowledge in the early Victorian period was such that it was difficult for the public to distinguish clearly between the experienced 'scientific' practitioner and the 'quack' or 'empiric' whose very existence seemed to be encouraged by the exclusiveness, internal squabbling and jealousy of the three regular professional orders. In this climate, the unorthodox could flourish, even in the bureaucratically administered state sector. It was a matter of serious concern to the licensed practitioner that when, in 1841, the M.P. for Lambeth made enquiries into the operation of the New Poor Law, he discovered that out of a total of 1,840 candidates seeking medical appointments in accordance with the provisions of the

Act, 320 had never been examined in surgery, 323 had never been examined in general medicine, and 243 had undergone no professional examination of any kind. Yet all these were quite legally eligible for the Poor Law posts.(118) Evidence submitted to official government commissions in 1834 and 1847 confirmed what regular practitioners already knew from experience - that quackery was rife, that unlicensed and unqualified practitioners outnumbered the licensed and qualified perhaps by a margin of two to one, and that the former were particularly entrenched in providing medical aid of many kinds to the swelling proletariat or rural labourers.(119) In these circumstances political intervention was necessary to secure redress for professional grievances.

The urgency with which spokesmen (such as Thomas Wakley and Charles Hastings) representing the interests of regular doctors waged unrelenting warfare on quacks, charlatans and mountebanks, bespoke how much - in the last analysis 'professional' authority - was at stake on the outcome of disputes between 'orthodox' and 'unorthodox' healers. Yet the term 'unorthodox' applied to medicine glosses over a wide variety of discrete groups of practitioner selling different commodities on the medical market, and posing different kinds of problem for professionalising doctors. By disaggregating the phenomenon of 'quackery' and focussing more concretely on specific categories of

alternative practitioner and the different strategies adopted by the orthodox to discredit and undermine public confidence in 'alternative' medicine, we shall see how professional norms and values were in a constant state of historical flux; that the medical profession was not a homogeneous undifferentiated community with clearly defined boundaries; and the professional knowledge embraced a multitude of disciplines and practices. The latter's epistemological legitimacy to medicine was an outcome of competitive struggle between groups of practitioner - a struggle in which the relative power wielded by each fragment was ceteris paribus the ultimate determinant of success or failure.(120)

In a penetrating sociological analysis of professional formation, Johnson has demonstrated how the distribution of power within a particular society will affect a specific historical mode of professional-client relationship. My contention here is rather that power variables also have direct bearing upon the relationships that obtain in different periods and societies between different segments of an occupational collectivity. The social distribution of power within the wider group will influence, if it does not determine, which segments will succeed in gaining professional status and rewards.

An earlier generation of historians focussed on the quack as an 'obstacle' to the mature emergence of

scientific medicine, tacitly sided with regular practitioners themselves, and endorsed the image of the quack as an ignorant, self-seeking charlatan. The present analysis makes no presumptions whatever about the epistemological status of conflicting accounts of the nature of illness invoked by different groups of healers. On the contrary, in a period when the populace remained largely sceptical of regular doctors' scientific pretensions, the social and political factors which determined the definition of the scope of legitimate professional medicine are more apparent.

Rosen has made the crucial observation that

"<w>hether and how science and medical knowledge is brought to bear on health problems not infrequently depends more on the interests and ideology of politically and economically powerful groups than on medical or scientific validity."(121)

Though important, this formulation is not wholly adequate because of the implied contrast between 'medical and scientific validity' on the one hand, and 'the interests and ideology of politically and economically powerful groups' on the other. For modern sociology of scientific knowledge has shown how the latter factor is at work not merely in the case of knowledge we would now hold to be 'invalid'.(122)

Knowledge, we might loosely say, can be multifunctional - it can be both technically or therapeutically efficacious, and, simultaneously and inseparably, express specific social interests. Newtonianism is a

good example of a body of knowledge whose technical adequacy was long recognised, but which has also been shown to express clear religious and political interests.(123) Modern sociology of knowledge has also illumined the medicine of the early modern period, when elite university-educated physicians used their social position to draw rigid 'cognitive' barriers between physic and astrology as fields of knowledge to the eventual marginalisation and effective exclusion of the latter as a legitimate element or constituent of medicine as such.(124)

Similarly, returning to the nineteenth century, orthodox medical practitioners or allopaths advanced normative claims about certain selective forms of knowledge, which they characterised by the pregnant epithet 'scientific', as a strategic ideology whose ultimate objective was the restriction of professional status to themselves, and the exclusion of threatening outsiders. By adopting the relativist perspective of the sociology of knowledge and applying it to medical reformers' campaign to suppress 'quackery', we shall continue to illumine the rhetorical role of scientific culture in the professionalisation of Victorian medicine.

One important episode in the history of orthodox doctors' uncompromisingly aggressive confrontation with 'unorthodox' threats to the construction of professional identity brought the career of one of University College

London's first Professors of Medicine to a drastic conclusion in 1839. John Elliotson's (1791-1868) Edinburgh training and long-standing interest in French medicine had equipped him with a secure grasp of scientific medicine by the time he succeeded John Connelly as Professor of the Nature and Treatment of Diseases at University College in 1831. His achievements included translating the work of Blumenbach, assisting in the foundation of University College Hospital, introducing the clinical methods of Laennec to London, experimenting with pharmaceuticals and systematically developing the study of physical signs in Britain.(125)

Elliotson was also a popular member among the cultural activists who patronised scientific and literary societies; he was depicted as Dr. Goodenough by Thackeray in 'Pendennis'; he was actively involved with William Sharpey in the affairs of the Royal Society; and he was T.H. Huxley's predecessor as Fullerian Professor of Physiology at the Royal Institution. Despite his distinguished reputation and impressive academic qualifications, Elliotson was forced to resign ignominiously from his teaching at University College in 1839 amidst a storm of controversy over his espousal of medical mesmerism, and a welter of vitriolic invective (co-ordinated by former colleague Thomas Wakley) charging him with tarnishing the professional reputation of Victorian doctors.(126) Even after Elliotson's dismissal, the campaign to expose medical mesmerism to

public ridicule continued unabated. "We propose to extirpate unsparingly", declared the editors of the Lancet in 1846, "everything that openly or secretly lowers the dignity or rank of medical science and its professors." (127)

The determination to carry out such extirpation stemmed logically from the goals and objectives of medical reformers. Enhancing the public image and respectability of the qualified practitioner by explicit reference to the critical dependence of public health on the advance of scientific medicine and the consequent elimination of irregular unorthodox groups who threatened to jeopardise it, was an integral aspect of a professionalist strategy. Mesmerism presented radical agitators pursuing this strategy with a grave and potentially embarrassing Gordian knot of encumbrances which had to be untied if the social and professional aspirations of doctors were to be promoted. (128)

Throughout the 1830s and 1840s, medical mesmerists were posing regular practitioners with serious problems. The threat was all the more subversive because mesmeric activity had ceased to be a merely fashionable diversion for the aristocracy; it had become a phenomenon that gripped the imagination of the populace, an important element of popular culture. Unlike the more mundane forms of quackery and empirical practices, mesmerism also posed an explicit challenge to the theoretical basis of scientific medicine. Mesmer himself

espoused a liquidity theory that resembled, in many respects, the long-established traditions of humoral pathology. In common with self-styled proponents of 'scientific' medicine, Franz Anton Mesmer had drawn upon existing social, cultural and intellectual resources, but fused them to produce a unified and coherent 'system' - a synthesis sophisticated and compelling enough to convert a man of Elliotson's academic stature into an effective compurgator on Mesmer's behalf. Public exposure of the theoretical fraudulence of medical mesmerism and of the 'sordid' motivations of its exponents, inevitably followed from the realisation of orthodox doctors that mesmeric principles were thoroughly subversive of the predominantly somatic categories on which the scientific medicine of the period was based.(129)

Even more minatory for the professionalist strategy of regular doctors was the success of mesmeric medical practice, for it was almost inevitably on practical grounds that the Victorian populace judged the different medical sects. Mesmeric practitioners claimed that their work was of proven therapeutic value, even offering surgical patients some anaesthetic relief from their agonies, when the nation's leading surgeons could offer little beyond speed and dexterity.(130) Conflicting views about the proper relation between education and practice underpinned the hostility between orthodox and unorthodox practitioners during this period of

reform. Medical mesmerists dared to earn a living by practising without formal qualifications, thereby denying the qualified the right, as they saw it, to monopolise the medical market. Mesmerism, as Parssinen has correctly argued, threatened to undermine the very legitimacy of scientific medicine, "by disputing its claim to possess exclusive, esoteric knowledge about the nature of disease and health." (131) Elliotson's professional career at University College London was one casualty of regular medicine's aggressive reaction to that threat.

William Henderson was another casualty of the processes whereby regular scientific practitioners sought to define and consolidate their professional cohesion around a particular configuration of knowledge. Like Elliotson, Henderson had undergone a conventional medical education, secured high academic qualifications, and acquired a formidable reputation as a scholar and teacher. These were sufficient to gain him professional employment as Professor of Medicine and General Pathology and Professor of Clinical Medicine at the University of Edinburgh. (132) Henderson also discovered that occupancy of so prominent a professional position in a prestigious medical school squared uneasily with heterodox medical teaching.

Henderson earned the vilification of the same assertively orthodox groups who interrupted Elliotson's erstwhile distinguished career at University College

because of his conversion to, and advocacy of, homeopathic medicine. In 1845 Henderson published "An Inquiry into the Homeopathic Practice of Medicine"(133) in which he expounded and developed the principles and therapeutic prescriptions of Samuel Hahnemann's (1755-1843) compelling homeopathic system. The systemic character of homeopathy, as with mesmerism, provides the key to explaining the virulence with which 'scientific' medical men condemned Henderson's study. From the standpoint of the orthodox, defence of homeopathy was indefensible for it sought to perpetuate those 'metaphysical' systems which late eighteenth century physicians had supposedly transcended and eliminated.(134)

Hahnemann's therapeutics, rooted in a romantic cult of the vis medicatrix naturae shared, despite its apparently paradoxical 'empiricism', some of the systemic qualities of eighteenth century medical knowledge. In "Essay on a New Principle for Ascertaining the Curative Powers of Drugs"(1796), "Organon"(1810) and "Chronic Diseases"(1828) Samuel Hahnemann advanced the hypothesis that medical truth could be measured solely through therapeutic experience.(135) Orthodox solidist allopathic medicine was assailed for basing therapeutics upon erroneous assumptions concerning the aetiology of disease, and for extrapolating theoretical causes from beyond what the physician perceived with his own senses. Homeopathy was directed towards the derivation of an

accurate symptomatology based upon real therapeutic experience.(136) The two principal axioms of the homeopathic system were: first, that every powerful medicinal substance induced a peculiar kind of disease in the body; and second, that medicinal substances able to produce similar 'artificial' symptoms should be employed as cures for specific diseases (similia similibus curantur). For an historian to berate, as does Lester King, the 'excesses' and 'dogmatism' of homeopathy, or to complain that Hahnemann "had no scientific training, no respect for facts"(137), is not only mindless whiggism, but almost literally absurd. Probably more than any other doctrine in the history of medicine, homeopathy, in rhetoric at least, was radically, purely empirical: the 'facts' of each individual case alone supplied the physician with data on which an efficacious therapeutics and an accurate medical science alike must be constructed.

Homeopaths' claims to have discovered empirical facts about diseases and effective therapeutic methods of curing them were seized upon by allopaths for the most uncompromising derision. A reviewer of Henderson's homeopathic 'Inquiry' of 1845 had nothing but contempt for the author's intention to remove the misconceptions surrounding his subject. "The statement that homeopathy must be tried on its practical results", the reviewer asserted impatiently, "has been repeated again and again ad nauseam." Yet "<t>he experience of everyday life", in

his opinion, "contradict<ed> so manifestly the importance attached to the infinitesimal doses, as to render further researches on the subject unnecessary."(138)

The administration of infinitesimal doses was the hallmark of homeopathic therapeutics, a logical outcome of the principle of similia similibus curantur. That it could be defended and recommended by a recognised Professor of Pathology at a British university was beyond the comprehension of the reviewer, who expressed his "utmost astonishment" at Henderson's views. As the review continued;

"<a>t a time when that science <pathology> is making the most rapid progress, when organic chemistry and the microscope are clearing the way for a rational system of medicine, and when even the bulk of the profession have been brought to watch its progress with interest, we are boldly taught that for the great purpose for which it is studied - namely, the treatment of disease - it is a mere delusion."(139)

Once we recognise that the doctrinal aspects of homeopathy, its symptomatological focus and its therapeutic prescriptions for infinitesimal doses did not relate solely to debates about medical theory and practice, but were inextricably bound up with the social and political goals of medical reformers, the intemperate language of homeopathy's adversaries becomes quite explicable. As Henderson's own unsympathetic reviewer emphasised,

"nothing <could> be more irrational; nothing <could> be conceived more dangerous to the

progress of medicine; and that such a doctrine should be taught to students in a British university celebrated for its medical school, <was> deeply to be deplored."(140)

The review concluded, somewhat maliciously, with the observation that every 'intelligent' student attending Henderson's pathology lectures could scarcely do otherwise than regard his professor with contempt.

Not content to allow the review of Henderson's books to speak for itself, the editors of the Lancet sought to drive the message home by expressing outrage at the fact that Henderson could publicly administer homeopathic remedies to patients in the presence of students, whilst the orthodox prescriptions of Dr. Alison, acknowledged leader of the Scottish medical profession, were set aside as valueless. On the ultimate consequence of allowing a teacher openly espousing homeopathic doctrine to pollute the minds of prospective doctors, and on the means of preventing it, the editorial concluded forthrightly;

"<o>ne thing at least is certain, that unless speedy means be taken to expel the homeopath, the University of Edinburgh may bid farewell to its medical school. Surely students will no longer be forced to attend the lectures of a professor who practises the grossest empiricism. They should exhibit a determined opposition to such a regulation, and petition the authorities, whoever they may be, to cancel the appointment."(141)

The whole episode is revealing evidence of the extent to which control over medical education (in turn bound up with control over the selective transmission of medical

knowledge) was perceived as critical to the successful accomplishment of professionalising strategy linked to medical reform.

Orthodox 'scientific' practitioners not only sought to expel homeopaths and other professional deviants from all medical schools, but also systematically excluded them (irrespective of ability or qualifications) from the burgeoning medical societies of metropolis and province alike.(142) A violent response was appropriate to the circumstances, as homeopaths so flagrantly undermined regular practitioners' claim to exercise professional authority on the basis of scientific expertise. The claim they advanced was inherently universalistic; the cognitive status of scientific medicine countenanced no exceptions. It was applicable and necessary for all patients, not just those enlightened enough to patronise orthodox practitioners.

Normative claims about the scientific basis of medical allopathy must be seen as a strategic ideology advanced to restrict professional status to those possessing appropriate socio-cognitive characteristics. Anti-homeopathic ideology was developed to serve the explicit social use of defining, branding and stigmatising homeopaths as medical 'deviants' or 'heretics'. Regular practitioners subjected outsiders to social control mechanisms to further their claims to political and scientific legitimacy. Virulent propaganda directed against the evils of 'quackery' bore witness to

a profession fearful of social and cognitive crisis.(143)

The socio-cognitive marginalisation of external competitors such as mesmerists and homeopaths(144), suggests that the campaign for medical reform was partly about securing a professional monopoly. The ultimate objective of exposing unorthodox medicine to ridicule was to convince the public and the legislature that unqualified and unlicensed practitioners should be suppressed, thereby conferring on doctors a new monopoly over practice.(145) Thomas Wakley's own "Bill for the Registration of Qualified Medical Practitioners and for Amending the Law Relating to the Practice of Medicine in Great Britain and Ireland" was, in the last analysis, a bill against quackery seeking to prescribe tests of competence for all candidates wishing to place their names on a national register which alone conferred the legal right to practise medicine.

It was a means of distinguishing between "legally qualified physicians, surgeons and apothecaries and mere pretenders to a knowledge of medicine and surgery."(146) Wakley's legislative proposals, which failed to secure the assent of Parliament, went hand in hand with merciless denunciation of the pretensions to true knowledge of a multitude of different unorthodox practitioners - monopolisation tactics expressing processes directly associated with knowledge production and certification within the sphere of medical science.

Science Versus Quackery, or Quackery Versus Science?

It is important to recognise here that medical mesmerism and homeopathy were to some extent special cases of quackery and not necessarily typical of unorthodox practice as a whole. Certainly the kind of quackery most commonly encountered in routine, everyday practice was the peddling of a host of medical nostrums, panaceas for every kind of ailment and debility from mild distemper to epidemic disease.(147) The health care market place swarmed with quack remedies, a constant source of pecuniary and professional concern to the reputable practitioner self-consciously eschewing the tradesmanship that was the hallmark of quackery. One distinguished historian has recently argued that regular medical men saw the problems posed by practice in an age of 'laissez-faire', and the issues of licensing and monopoly to which they gave rise, "more in terms of protection from competition than in terms of the superior claims of medical science." (148) Trading in quack remedies had reached formidable proportions by the 1830s and 1840s, and clearly represented a direct threat to the economic well-being of the regular doctor. Yet during this same period, medical men championing the interests of the emergent general practitioner were already attuned to the ideological cachet that might be purchased by rhetorical appeal to the epistemologically privileged culture of science, as their reaction to mesmerism and homeopathy unambiguously revealed.

Peterson's mistake, of course, is to pose 'economic competition' and 'the claims of science' as alternative explanations for the attitudes of the early Victorian doctor towards unorthodox practitioners and the regulation of their practice. This has the effect of seriously underestimating the extent to which economic competition and scientific innovation had by this time become inextricably intertwined in a symbiotic relationship as the underlying dynamic of the professionalisation of medicine.

Whether or not the espousal of science had any strategic importance in the efforts of rank-and-file medical practitioners to build a profession for themselves during the decades preceding the Medical Act of 1858, is a critical question. Direct evidence of the goal-orientations of prominent active participants in the reform movement, and the bearing, if any, of the culture of science on how these goals might be advanced would be of considerable value in addressing this question. The discourse of Sir Robert Harry Inglis (1786-1855), an MP who used his political position to press for urgent reform of the government and organisation of the medical profession offers the historian just such evidence.

In 1841, Inglis wrote three letters to an associate (Joseph Henry Green, FRS), in which he expounded a programme for medical reform and an underlying political philosophy, giving expression in his exposition to the

interests of the regular Victorian doctor.(149) One of the most effective means of furthering these interests was to identify them as strongly as possible with the advancement of the public health and the general interest of the community as a whole. Inglis' letters were intended

"for the guidance of those who undertook to re-model the medical profession in consonance with its dignity and welfare, and with the needs and requirements of society inseparable therefrom."(150)

Inglis assumed (as have many present-day historians) that medical 'needs' and 'requirements' were autonomous and self-evident, thus glossing over the way that physical needs have often been socially shaped by interest-groups like those Inglis represented.(151)

Inglis considered the optimum qualifications demanded of a medical practitioner to advance the public health, and contended they were threefold:

"1st, <t>he possession of technical knowledge and skill in that degree which shall enable each member of the profession to apply all the resources of art, which the whole profession can supply. 2ndly, <s>cientific insight, or the possession of the knowledge of those laws on rational grounds, which form at once the principles and ultimate aims of all professional knowledge. And 3rdly, <t>he character of a gentleman, that his conduct shall be the pledge and proof that he pursues his profession as a liberal science, and that, in all his dealings with his patients, his professional brethren, and the community, he is ever guided by the principles of strict professional honour."(152)

Inglis' juxtaposition of these three elements perfectly expressed the ambivalent social position of

regular practitioners whose interests he here articulated. Technical know-how was necessary to ensure the doctor's competence and the effectiveness of his remedies; but professional practice, unlike quackery, went beyond this in drawing upon 'scientific' principles. And whereas the general practitioner's technical expertise differentiated him from the purely erudite elite, he nevertheless resembled the latter in possessing the gentlemanly bearing and demeanour properly expected of a member of a true 'profession'.

On the necessary interconnection and dialectical relationship between 'science' and 'professionalism' (the central theme of the entire thesis) Inglis was adamant and unyielding. "In every liberal art," he insisted,

"the cultivation of which by a class of society constitutes a profession, in contradistinction from a trade or mechanic art, there must be a scientific element either as the ground of its knowledge and practice, or as the proposed object."(153)

Scientific insight Inglis defined more precisely as "the possession of those laws or rational grounds which form at once the principles and ultimate aims of all professional knowledge"; and a liberal profession as "the application of science by the actual possessors of the same to the needs and commodities of social man."(154) The very root of a profession, and what distinguished it unambiguously from a mechanical art or trade was, for Inglis, simply science.

If our thesis that science was employed as a resource by rank-and-file Victorian doctors as early as the 1830s and 1840s notwithstanding the evident therapeutic sterility of 'scientific' medicine (which appears to have influenced historians' negative judgements on this question), then one would expect a spokesman like Inglis to direct his assertive compurgation pro scientia against outsiders threatening to undermine 'professional' objectives. Inglis' reference to "a sacred war"(155) between inherently antagonistic forces - science and its 'liberal cultivators' on the one hand, and, on the other, quackery and 'the contraband trader in nostrums and stolen fragments of knowledge' - suggest that our thesis is indeed correct.

Inglis' conception of the function and purpose of medical education followed logically from his espousal of 'universal science', and confirms the hypothesis in question. The only legitimate object of medical education, according to Inglis, was that of establishing a 'science of medicine'. The paramount object of any course of medical studies was to instil in the student "discipline and training of the mind to that which is universal and necessary in order to enunciate causative principles and immutable laws manifested in living forces."(156)

Inglis' observations on the scope and character of medical education reveal a conception of science as an instrument for the achievement of desired social

goals. Scientific education was advocated as a means of rationalising and standardising a cognitive basis around which recruitment to a profession could be organised and restricted. It was espoused to disadvantage and ultimately eliminate external competitors - other groups struggling for jurisdiction and control over comparable areas of work - accomplishing requisite social distance and marginalisation, but clothing it with the 'objectivity' that 'scientific' principles might ostensibly provide.(157) Understanding the complexity of the human body in health and disease (without which effective therapeutic intervention was supposedly impossible) was, for Inglis, a task which science alone offered the possibility of accomplishing, and which, in consequence, the quack or vulgar empiric was fated to strive to achieve in vain. Conceding that the vicissitudes of medical practice sometimes demanded empirical techniques even of the most sophisticated physicians, Inglis nevertheless insisted that it was

"the absence of science, or the contemptuous neglect or disclaiming of the same; ... the elevation of a blind empiricism above science, and as superseding all connection therewith, that constitute<d> the empiric and in all reason degrade<d> him to a carrier on of a trade, a business, or, at best, an equivocal art."(158)

Whenever sordid and mercenary motives superseded the scientific aim, a member of the professional class of Viri Liberales would, in Inglis'view, inevitably be degraded to the status of a mere trader. Inglis

promulgated what was effectively a manifesto for the professionalisation of Victorian medicine, proclaiming the ultimate mission of the regular practitioner;

"<w>e demand of all <the profession's> members scientific aims and objects; we denounce as empirics those who neglect or disclaim science; we reject as tradesmen those for whom the profession is only a lucrative business; and we brand as quacks those who dishonestly make it the means of levying a tax on the hopes and fears of the ignorant and credulous."(159)

Inglis demanded action against the incursions of a numerous group whose work encroached upon that of qualified medical practitioners. The role he envisaged for a reformed system of medical education in support of this demand is important not only in terms of his individual contribution to the medical politics of the period(160), but also because it sheds light on the collective strategy pursued by qualified against unqualified practitioners. At bottom, the strategy was to monopolise the supply of medical services and eliminate external competition by controlling access to medical education.(161)

In his third letter to Green, which discussed the regulation and the economy of the profession, Inglis' personal convictions and the interests of the groups he represented were at one when he stressed that the indispensable conditions for achieving and maintaining "a medical class" were

"the supply of duly qualified practitioners, the means of forming such by suitable schools and efficient teachers, and the

vigilance of legally constituted authorities in order to apply the requisite tests of competences, to give designation and authority to those who have stood the tests of their examinations, and to protect the profession and the public from the intrusion and malpractices of unqualified persons."(162)

Inglis here articulated precisely the reasons why it has been the historic objective of professionalising doctors to dominate institutions of medical education; and why, ultimately, it was to universities and colleges that they turned to accomplish their educational objectives.(163)

'Science', viewed as a "cardinal system of cognitive validation and legitimation"(164), and in terms of specific bio-medical fields such as phrenology and chemistry, did play some role in general practitioners' anti-monopolisation strategy, though other factors - a more corporate organisation, active involvement in the politics of medical reform, the development of medical ethics and even emulation of the cultured gentility of the elite - were also of major importance. Nor have we concealed the divorce between doctors' growing claims about scientific medicine and the efficacy of science in therapeutics. Nevertheless, whilst the increasingly scientific basis of medical knowledge and practice had little discernible impact on therapeutic effectiveness, the rising cultural and intellectual status of science furnished some prestige and authority for rank-and-file medical men in both challenging the privileges of an

unrepresentative and undemocratic elite and in marginalising the 'sham' theories and methods of the irregulars. More intensive empirical research on groups of general practitioners would be necessary to substantiate this view.

The following chapter examines a third context in which the medical profession were fortunate in possessing science as a knowledge-base on which socio-economic and political objectives might be realised, albeit less explicitly and more unselfconsciously than in the previous contexts; and sociological analysis of medical interest-groups is brought to bear on medical legislation passed between 1815 and 1858.

CHAPTER FOUR

PROFESSIONALISATION, THE STATE AND MEDICAL LEGISLATION, 1815-1858.

"No medical knowledge, no sanitary provisions, and no sanitary legislation can make head against laws of nature, physical or moral. If population increases beyond the means of healthy subsistence, disaster must follow. It seems to me that at present sufficient attention is not paid by sanitary writers to the fundamental truths advanced by Malthus, but often overlooked or misunderstood."(1) H.W.Acland, (1871).

"If I can read anything in the history of the globe, it is this, that the great qualities of the people depend in large measure (except in rare circumstances) upon the physique of the nation ... So far as the comparative national health is concerned, I say there is no possibility of exaggerating the importance, not to our own country alone, but to the world, of fostering and caring for the body of man."(2) H.W.Acland, (1873).

The main concern of this chapter is to examine the process, inchoate yet discernible during the 1815-1858 period, whereby science began to emerge as a necessary 'solution' to the vast far-reaching, social problems spawned by the onset and rapid development of demographic growth, industrial change and urbanisation - that whole complex of social and economic 'bouleversements' commonly referred to as 'the industrial revolution'. The recurrence of a welter of epidemics and diseases, the profusion of a whole panoply of illnesses experienced on a hitherto unprecedented scale opened up the field of public health, betokening a new relationship between the medical profession and the state. Elucidating this new relationship demands focussing on the social environment in which English

doctors practised; Victorian governments' abandonment of 'laissez-faire' principles as regards public health; and how local administrative bodies, a new civil service and other state institutions utilised scientific expertise thereby privileging many new professionals in the furtherance of their own socio-political objectives. All these issues had bearing on the future direction of medical education.

The Social Environment, Urban Squalor and Disease.

Historians have long disagreed over whether the early phases of industrialisation brought with them a rising standard of living assessed in terms of quantitative material indices for the bulk of England's population. Yet few have doubted the qualitative human misery and suffering (partly physically and partly socially determined) endured by the majority of the labouring population in the first half of the nineteenth century.(3) Rural arcadia and the rustic bliss evoked by a generation of romantic poets in response to the depredation and crass materialism of commercialism(4) had no basis in reality; but the squalor, degradation and pestilence that thrived on the social conditions found in new industrial towns were real enough for their inhabitants, many of whom faced a life which promised (to adopt a Hobbist metaphor which was incorporated in some variants of political economy) to be "nasty, brutish and short".

Urban growth was particularly rapid in the 1830s and

1840s. Between 1831 and 1851 Birmingham's population grew from 144,000 to 233,000; Leeds' from 123,000 to 172,000; and Manchester's from 182,000 to 303,000. At the outset of the nineteenth century only London possessed a population of more than 100,000; by 1851 there were nine such towns.(5) Contrary to the impression created by an earlier generation of historians and social commentators, the extent to which extreme poverty, endemic suffering, crime, prostitution and public disorder were routine facets of everyday life in Victorian towns and cities, varied considerably: the experience of Bradford and Manchester was not mirrored in Chester and Cambridge.(6) Nevertheless, in the social history of towns may be found both the origin of the new relationship forged between the Victorian medical profession and the state, and the basis for the development of specialisms within the corpus of medical knowledge.(7)

Urban conditions presented the Victorian health professions with literally impossible tasks - a fact that worked both for them, in the sense that the sheer enormity of socially-produced morbidity and mortality opened up a privileged conduit to governments able to confer monopolistic privileges to advance the 'public interest'; and against them in the sense that these circumstances also virtually guaranteed a secure market for quack competitors in the absence of state-sanctioned proscriptions. In Victorian industrial cities, men,

women and children were employed in unregulated factories at monotonous tasks between fourteen and sixteen hours per day, six days a week; teeming slums were the scenes of every imaginable degradation; human sewage and industrial waste festered; overflowing cesspools polluted the water supply; a single privy might serve the excrementary needs of scores of inhabitants of overcrowded multi-family dwellings; and 'nouveaux riches' industrialists abdicating all social responsibility in an anarchic orgy of profit-seeking effectively inflicted a smoky blight from factory chimneys on the hapless population. This was the context in which the 'condition of England' question became paramount; in which Engels wrote his acclaimed study of the condition of the English working class in the hungry forties; and which inspired John Ruskin with the metaphor of 'the storm cloud of the nineteenth century', symbolising the existential condition of modern man poisoned, choked and blackened by an industrial system of urban squalor and factory life.(8)

The critical importance of such conditions to our theme is their bearing upon the altered disease relationships created by industrialisation, and their impact on the project of professionalisation. Although changes in ecological balances which accompanied agricultural and industrial development worked to eliminate one of the most fearful of all pestilences (bubonic plague), new industrial conditions were a

fertile breeding-ground for morbidity and mortality.(9)

Most obviously, the scatalogical environment produced a series of epidemics of cholera and typhoid and a wide range of related sanitary diseases; the operation of the factory system brought a host of occupational diseases, serious work-related hazards and physical dangers (quite apart from the psychological impact of socially-produced alienating patterns of work experience); and poverty caused malnutrition and reduced the body's resistance to many kinds of illness and disease. In sum, the evils of industrialisation and urbanisation before 1850 had turned many of England's towns and cities into an environment in which endemic and epidemic diseases appeared to confirm the spectre raised by Malthus, wreaking havoc with the population, or, more accurately, with the labouring population.(10)

Sanitary Science and State Intervention.

The 'raison d'etre' and central rationale of 'sanitary science' was evoked by its principal advocate, Edwin Chadwick's reference to 'the Want of Science in our Public Works.'(11) Ironically, this uncompromising Benthamite, who had nothing but contempt for the medical profession and was scorned by Wakley, pointed the way to fully-fledged professionalisation by the assimilation of the state and professional expertise - a creeping process that paralleled the complex evolution of the modern state.(12) Insofar as the Benthamite commitment to efficient government and the elimination of

of amateurishness emerged in the form of 'a science of public virtue' which appeared to reconcile the public interest with the growth of industry. Urban crises and the recurrence of large-scale epidemics served to underline the strategic value of the medical commodity - an expertise which grew out of a macroscopic utilitarian synthesis of sanitary chemistry, health and industry proving the efficacy of scientific enterprise pro bono publico. (35) The new professionals' positivist ideology of science as method was constructed out of this powerful triangular configuration of knowledge, service and profit. It not only justified the social aspirations of civic scientific experts, but also those of a rising community of managerialist segments of the middle-class, posing as custodians of expertise.

Manchester, as Victorian England's industrial city 'par excellence', was an environment in which the gradual extension of administrative scientism, and the regulation of urban conditions seen to threaten the overall stability and integrity of the social order, proved a fertile source of professional employment for medical men, all too conscious before the end of the 1830s of their marginality and the prevalent amateurism of their science. Scientific expertise in the form of Liebig's sanitary chemistry was drawn upon as a resource to further the project of creating desirable opportunities for remunerative positions in industry or state administrative agencies. The process by which jobs

made in accordance with the principles of Benthamite utilitarianism, such as the Factory Acts. Thirdly, an interest in social control or regulation might, as with the extension of public education, stir governments out of their dogmatic liberal slumbers. Finally, intervention might take place to forestall a threat to national security or to enhance national superiority.(16)

Morrell somewhat dubiously contends that only the last set of circumstances and, in particular, the alarming rise of German industry to a position of apparent world supremacy, could be made relevant to the condition of British science as late as 1870. More critically, Morrell completely overlooks the medical ramifications of the debate on state intervention. One need mention only the physical sufferings endured by many workers in sweated trades; the passage of Public Health Acts; governmental interest in comprehensive statistical information about the populace; and the obvious dependence of national economic and military supremacy on the fitness and physical well-being of the population, to grasp that health personnel were in a favourable position to canvass for state intervention on all four of the criteria specified above.

Medical knowledge as 'science' figured prominently in governments' efforts to secure stable social and political conditions by solving a range of social problems relating to health, sanitation and safety. The

more governments came to recognise as regards health administration that "in matters of science there <was> a common measure of truth by which differences of opinion <might> be accurately adjusted"(17), the more readily would they defer to the professional expertise owned by qualified medical scientists. What was required therefore of medically-related occupational groups seeking professional status was to engineer a transformation of governmental perception of the relevance of science to the control and the ultimate resolution of strategic social and economic problems. In prosecuting this task the medical profession were favoured by the spread of ideas about the importance of rational and efficient administration, commitment to which increased the acceptance of 'scientific' values, and opened the way to the employment of medical scientists in a proliferating number of roles demanding specific expertise.

However, there was no guarantee that legislative reform along rational-legal lines would automatically operate to the advantage of the professions. The New Poor Law of 1834 revealed what rationalisation on the basis of 'science' (i.e. political economy) meant in concrete terms; we have seen that it was notoriously parsimonious in its remuneration of Poor Law doctors as it was harsh on the indigent poor. So qualified was governmental endorsement of the principle of state intervention, and so ad hoc was the manner in which it

took concrete shape over the whole sphere of social policy that historians have debated what the so-called 'nineteenth century revolution in government' amounted to. Was it all political pragmatism in which only specific circumstances demanding remedial action brought about any extension in the ambit of government; or was there a hint beneath the chaotic diversity of successive measures of social reform of some lurking underlying ideological commitment?(18) Judged in terms of financial investment in state-sanctioned administrative activity and public utilities - a barometer for measuring governmental attitudinal orientations - the contrast with Germany indicated the relative tenacity in England of the liberal orthodoxy that state spending in any area was more likely to retard than promote economic growth. It is difficult to dissent from Crossley's judgement that Victorian governmental institutions "pursued science for policy, rather than representing any coherent policy for science."(19)

The relative paucity, moreover, of state intervention in the health sphere clearly revealed how little the criterion pro bono publico held sway with virtually all governments even in so vital a national interest as public health. Before the 1830s, when the state first embarked on significant intervention in the field of social welfare, total public expenditure on health and medicine amounted to 2,000 for vaccination against smallpox.(20) In a climate so unreceptive to

collectivist ideas, governments were reluctant to intervene even to redress the high social and economic costs of an unregulated system. It took exceptional circumstances (like the large-scale panic engendered amongst all social classes by the outbreak of major epidemics such as typhoid and cholera) to galvanise the authorities into action. The cholera epidemics of 1832 and of 1848 certainly proved to be a more effective and powerful ally of medical reformers than the barrage of propaganda issuing from the medical press - the British and Foreign Medical Review, the Medical Times and the Medical Gazette, as well as the Lancet - intended to force recalcitrant governments from their complacency over public health, thereby creating employment opportunities for those possessing the relevant expertise.

The medical profession continually emphasised that, alone among the established professions, medicine was the repository of a range of scientific disciplines and practices indispensable to the efficient administration and development of a modern industrial society. Complaining in 1846 that the medical profession had only one formal representative in Parliament despite its increasingly prominent social weight, Thomas Laycock insisted that it had nurtured a variety of useful sciences under its wide-ranging cultural and intellectual umbrella, unlike the law and the church whose superior privileges were based upon an exclusively

scholastic education. Throughout the nineteenth century, Laycock affirmed, medicine had acted as parent and protector to a multitude of sciences;

"otany, chemistry with its sub-divisions, galvanism and electricity; and natural history, in all its branches, <had> had physicians as their earliest and most constant cultivators. All these, without exception, <had> risen directly from the profession."(21)

Not all of these had the same instrumental value for governmental health regulation; nor was every region in the country equally ripe territory for the extension of public health activity and correlative investment of resources to increase governmental posts for experts. Local contexts, particularly the metropolitan/provincial axis and differences between urban and rural environments, remained critically important throughout our period and largely determined public health activity and the involvement of health care personnel in its provision.(22)

Manchester, Medical Science and Industry: A Strong Case of Symbiosis.

In considering on the one hand what Laycock referred to above as 'chemistry with its sub-divisions' and, on the other, the specific context of industrial Manchester, we will exemplify the most positive relationship between medical science and industry which clearly illumines the professionalist strategy of Victorian doctors.

By the 1830s Manchester had indisputably become the

model city of the industrial revolution, where the social consequences of industrialism were most dramatically revealed and most vigorously condemned by a new generation of social critics. Such evils as overcrowding in slum dwellings, sweated labour, the existence of abundant cesspools and sewers often serving as sources for drinking water, environments choking with smog and industrial pollution, child prostitution and vice were most starkly in evidence in Victorian England's greatest industrial city. Chadwick's Report on the Condition of the Labouring Population of 1842 referred to the 'appalling fact' that of all born of the labouring classes in Manchester, more than fifty-seven per cent died before the age of five.(23) The appalling social conditions which gave rise to such fearful infant mortality produced, at the same time, one of Victorian England's most numerous, vocal and thriving scientific communities in which medical men played an active and prominent role. Manchester's Literary and Philosophical Society, for example, comprised from the outset approximately sixty per cent of men from medical backgrounds, or with experience of medical practice: this association between the society and medicine proved enduring.(24)

How Manchester's medical men prosecuted science and to what effect on the long-term social project of professionalisation changed considerably between 1815 and 1858, as the general ideology of science evolved

from the stage of the gentleman-amateur to clerisy, and ultimately specialised technical expert. These developments occurred through a gradual shift of emphasis in the constellation of attitudes, prejudices and values constituting scientific consciousness, rather than by discrete quantum leaps.(25) The history of Manchester's Literary and Philosophical Society was exemplary in this respect. From being essentially a league of gentlemen with aristocratic cultural aspirations pursuing science as an interesting avocation, it was penetrated by members of the business community preoccupied with the diffusion of useful knowledge amongst the industrious classes. Eventually the dilettante faction became marginalised, and self-consciously professional scientists possessing specialised technical expertise emerged triumphant; but it was a slow and protracted process.(26)

Ultimately the impact of industrialisation in Manchester facilitated the gradual proliferation of science-based services consonant with the professional requirements and ambitions of doctors and scientists who spared no effort in propagandising their scientific cause, and either using existing institutions or transforming them if necessary, to achieve their goals. Whilst the remit of engineers and physical scientists was to emphasise that industry and economics (the very infrastructure of a modern city) were critically dependent on their scientific expertise, the remit of

medical men was to accentuate the central importance of sanitary science as a means of salvaging manufacturing cities from acute environmental disaster which might seriously threaten the public weal.(27)

Of extraordinary utility in furthering these objectives was the work of German chemist, Justus Liebig (1803-1873).(28) At the University of Giessen, Liebig established a successful research school, the first laboratory in which chemical research methods were taught systematically to young chemists, setting the pattern for chemical education throughout Germany and beyond.(29) Liebig's educational accomplishments, especially the extraordinarily charismatic influence he exerted on his students connects up with the professionalising activity of Mancunian medical circles. For Liebig supplied his followers in Manchester with a specific scientific ethos and a basis on which to create new careers for scientific men by administering to the relief of man's estate in the field of public health.(30)

During the late 1830s, Liebig's interest shifted from pure organic chemistry to its applications in the fields of manufacturing, agriculture, physiology and public health. The fruit of this change of direction was his enormously influential 'Organic Chemistry and its Application to Agriculture and Physiology'(31), the tenets of which offered governments a means of parrying and averting the Malthusian spectre, transcending the

awesome conclusions of the 'dismal science' of political economy. Whereas industrial chemists siezed upon Liebig's apophthegm that "the commercial prosperity of a nation depend<ed> upon the amount of sulphuric acid it consume<d>"(32), medical groups appropriated his sanitary chemistry for its applicability to the ever-expanding public health requirements of the first industrial nation.

Lyon Playfair (1818-1898) worked energetically to introduce and gain acceptance for Liebig's ideas; but Henry Ansell expounded Liebig's views on health, disease and sanitation for the Lancet's readership. The journal announced in the early 1840s that "the new era in medicine" had dawned, and that "a truly rational" approach to health problems had been ushered in by Liebig's chemical methods.(33) During the 'declinist' controversy in the 1830s, Liebig castigated English science in forthright terms. "England <was> not the land of science" he averred in 1837; there was "only a widely dispersed amateurishness."(34) Medical men practising in the industrial cities embraced Liebig's views on health and disease so enthusiastically because they endorsed so important a role for scientific experts in the field of public health and provided the outlines of a collective strategy to terminate the reign of the amateur.

As Kargon has argued in his trenchant study of Manchester's scientific community in the nineteenth century, the ultimate solution to the overriding problem

of amateurishness emerged in the form of 'a science of public virtue' which appeared to reconcile the public interest with the growth of industry. Urban crises and the recurrence of large-scale epidemics served to underline the strategic value of the medical commodity - an expertise which grew out of a macroscopic utilitarian synthesis of sanitary chemistry, health and industry proving the efficacy of scientific enterprise pro bono publico.(35) The new professionals' positivist ideology of science as method was constructed out of this powerful triangular configuration of knowledge, service and profit. It not only justified the social aspirations of civic scientific experts, but also those of a rising community of managerialist segments of the middle-class, posing as custodians of expertise.

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were created was far from smooth; governmental support was lukewarm except in periods of visible crisis; and intervention grudging even then.(36)

All this poses the critical question of how representative the Mancunian experience was of provincial medical groups as a whole. Because the intensive research necessary for a convincing answer to this question has not been undertaken, it cannot be resolved here.(37) It is unlikely that there are any a priori reasons why Manchester should be an exceptional case; and one recent study of the medical community in Victorian Sheffield suggests that the same configuration of interests and knowledge advancing the social goals of Manchester's medical men also operated elsewhere.

Sheffield's doctors not only played a disproportionate role in the cultural activities and institutional development of the city, but also actively cultivated alliances with the industrial middle-class (by far the most visible and most vocal interests in the new industrial towns). In Sheffield as in Manchester, 'Wissenschaft' and profit were reconciled to produce an identity of interest between the scientific expert, the citizen and the productive classes of society. In both cities too, medical men were already ideologically conditioned and professionally in need of the kind of social mission Liebig's chemistry and the 'sanitary ideal' betokened.(38)

Medical Legislation and Public Health.

With the gradual but seemingly ineluctable extension of formal rationality in the sphere of health policy (embodied in successive legislation) the trends under discussion became of increasingly national importance and local contingencies relatively less significant. Before 1858, the Poor Law Amendment Act of 1834, Chadwick's Sanitary Report of 1842, and the Public Health Act of 1848 gave expression to the new administrative scientism in the field of public health and welfare, embodying the Benthamite sanitary idea, as formulated and championed by Chadwick. The message repeatedly urged by Chadwick and like-minded reformers, was that disease thrived in urban environments; was preventable; that sewer arrangements, drainage, adequate ventilation, the cleansing of streets and roads, the supply of pure running water, and unpolluted air were all means by which health and cleanliness might be promoted at a cost - far less than was needlessly expended on illness, unemployment and destitution.(39)

Chadwick looked forward to a time

"when governments shall be induced to consider the preservation of the nation's health an object as important as the promotion of its commerce, or the maintenance of its conquests."

His inquiry into the sanitary conditions of the labouring population criticised "how strongly circumstances that <were> governable, govern<ed> the habits of a population, and in some instances appear<ed>

almost to breed the species of the population"(40), thus underlining how urban squalor and the disease it fostered were environmentally determined, and emphasising that practical measures could be taken by governments to combat them. The significance of Chadwick's 'miasmatic' interpretation of epidemic diseases was not that it was 'scientifically false', judged against the 'scientifically accurate' specific aetiology propounded by bacteriologists three decades later. Rather, Chadwick's view that epidemic diseases like typhoid and cholera spread through the atmosphere by malign gases produced by decomposing organic matter, conformed closely to the historical experience of such epidemics and encouraged positive salutiferous intervention by directing medical and administrative personnel towards their environmental determinants.

Chadwick made headway against both environmental sources of infectious diseases and powerful vested interests resistant to sanitary reform. His intervention did not reverberate directly to the benefit of doctors because of his suspicion (again perfectly legitimate at this time) of organised medicine. However, in Thomas Southwood Smith (1788-1861) and James Phillips Kay (1804-1877) the medical profession found Benthamite public health spokesmen whose medical training made them more valuable allies than Chadwick.(41) All these reformers were unanimous in their commitment to greater legislative interference to promote public health. In a

report on the health of towns in 1840 Salford Smith affirmed that if

"it be certain the conditions exist<ed> which <were> absolutely incompatible with the public health, and which conditions <were> to a very considerable extent removable; and if it <should> be found that similar conditions exist<ed> in all the large towns in Great Britain, here would seem to be a proper and legitimate field for the exercise of legislative wisdom and power."(42)

A central body might have adopted practical measures to advance the health of the community - removal of refuse from habitations and roads; draining and paving city streets; construction of sewers in accordance with known 'scientific' principles. Urban health crises could be averted by appointment of district medical officers; opening public parks to give urban dwellers easier access to green surroundings; and by 'educating' the populace to cultivate a more positive relationship with the environment.(43)

Reforming medical Benthamites continued to demand large-scale legislative action, but it took the reappearance of cholera in 1847 to galvanise Parliament to introduce measures embodying the widely-canvassed sanitary idea. The labyrinthine intricacies of sanitary administration and the complex provisions of the Public Health Act of 1848 cannot be examined here. The legislation of 1848 is important, however, as the culmination of a long campaign set in motion by Chadwick's Report of 1842 - a campaign which gathered

momentum under the impact of two Royal Commissions on the Health of Towns in 1844 and 1845.(44) The Public Health Act has been described as "possibly the most significant piece of health legislation in the nineteenth century" which "marked the first clear acceptance by the State of responsibility for the health of the people."(45)

The Act's most important provision established a General Board of Health comprising three members appointed for five years - Chadwick, Southwood-Smith and Antony Ashley Cooper. Machinery was also provided whereby certain districts could create and maintain local Boards of Health. Staffed with indefatigable advocates of sanitary reform, the Board of Health embarked on wide-ranging programmes of public sanitation, employing what legal powers it possessed to remove various sources of defilement from English towns, and to install water and sewer systems throughout the country. In carrying out its brief, the Board had extensive powers to inspect, audit and recommend but only limited power to control. In providing neither parliamentary control nor protection the Act was largely permissive following the extremely unpopular model of the Poor Law Commission. The voluntarism that continued to surround the activity of local authorities fell far short of the ultimate Benthamite prescription - a strong centralised policy enforcing minimum standards of public health.(46)

Yet such powers as the Act did confer upon the Board were sufficient to earn Chadwick many enemies. In the end, vested interests, devotees of 'laissez-faire', those who feared rate rises, and a large number who saw the parish as the natural unit of government and feared the extension of bureaucratic centralism, together proved powerful enough to limit the Act to five years. Even though the Central Board demonstrated how new cities brought into existence by the industrial revolution could become healthier environments than cities of the past, its tenure was terminated in 1854 and Chadwick's career came to an untimely end.(47) The crude 'laissez-faire' outlook of the editors of the Times was typical: it would be preferable, they opined, to risk the cholera epidemic than to be bullied into good health by the Public Health Board.(48)

Insofar as the machinery brought into existence in 1848 was intended to be permanent rather than a simple ad hoc expedient to cope with a short-term crisis, the legislation represented a genuine turning-point in the history of public health; but the Act's role in the professionalisation of medicine via the systematic creation of state employment was more attenuated. Nor did the legislation effect those large-scale improvements in the condition of England's urban environment anticipated on 'scientific' grounds. Six years after the passage of the Public Health Act, Sir John Simon complained that "the national prevalence of

sanitary neglect" remained "a very grievous fact."(49)

Giving expression to the discontent of scientific medical practitioners Simon continued,

"<t>he interests of human life, except against wilful violence, are almost uncared for by the law. The statutes tell us that our law makers, to the tether of a very scanty knowledge, have ... moved to the redress of some clamorous wrong. But - tested by any scientific standard of what should be the completeness of sanitary legislation, or tested by any personal endeavour to procure the legal correction of gross and glaring evils - their insufficiencies, I do not hesitate to say, constitute a national scandal, and, perhaps in respect of their consequences, something not far removed from national sin."(50)

The 'scientific standards' appealed to by Simon guaranteed by the possession of qualifications in medicine and chemistry were the means whereby the qualified sought appointments in new roles as 'public health servants' concerned with the creative administration of socially beneficent legislation. Such appointments were eagerly competed for by Victorian medical men; yet appointment to salaried positions was not secured without irony or ambivalence. On the one hand, the medical practitioner acquired public recognition for his 'scientific' expertise; but, on the other, a bureaucratic mode of medical practice drew its status from the 'authority of office' rather than from the 'authority of knowledge', which it tended to circumscribe. This had the effect of holding back the emancipation of independent 'professional' judgement and autonomy over work - long recognised as a critical

element of professionalisation.(51)

Medical Police.

In the first half of the nineteenth century it cannot properly be claimed that medical men had crafted a profession for themselves by persuading the legislature to intervene in the public sphere on their behalf qua occupational group. The Public Health Act notwithstanding, this period is striking for the absence of a strong centralised administrative structure seeking to establish a state medical system which could provide doctors with secure employment and publicly-sanctioned status. The specificity of the English experience can be defined comparatively if we consider whether a system of 'medical police' on the continental model can be said to have operated in mid-Victorian England.

Answering this question is critical to uncovering the dialectic of the professional development of English medicine in relation to the evolution of the modern state. The very term 'police' draws attention to the complex phenomenon of medicine as an aspect of social control, and to the theme of 'medicalisation', both energetically debated by present-day sociologists of medicine. It also poses the related question of the applicability to English historical experience of Foucault's generalised reflections on the role of medicine in the all-encompassing disciplinary apparatuses that hold modern man in constant subjection to discrete but ubiquitous power mechanisms.

'Medical police', which we may define as "the creation of a medical policy by government and its implementation through administrative regulation"(52), emerged in Germany during the second half of the eighteenth century. This was the age 'par excellence' of Machiavellian power politics, most notably in the Prussia of Frederick the Great, who embarked upon a systematic overhaul of the political, legal and administrative infrastructure of his monarchical state, so as to subordinate all aspects of society to 'raison d'etat'.(53) Under the influence of this rationalising momentum, the ideas of the 'philosophes' and theoreticians of 'police science', physicians adopted the concept of police and sought to apply it to health problems of the Prussian populace. Mercantilism (or 'cameralism' in the Prussian context) was a distinctive economic strategy directed to the same end of absolutism, in which the dualism of prince and 'Stande' as formulated by the famous nineteenth century German jurist Otto van Gierke, was overcome.(54)

The rationale of medical police lay in the provision of healthy subjects without which the monarchical state could not long maintain its supremacy.(55) The concept was first employed in Prussia by Wolfgang Thomas Rau in developing the statist political philosophy of Wolff. In concrete terms, Prussian medical police meant supervision of apothecaries' shops and hospitals, prevention of epidemics, combatting quackery and, not

least, organisation and direction of medical education. The scope of Prussian medical police was extensive; it grew directly out of the social, economic and political infrastructure of the absolutist mercantilist state in order to amass increased power and wealth for the monarch.(56)

Scotland witnessed the first introduction of the concept in Britain, and its Scottish exponents appeared to share the comprehensive totalising rationale formulated in late eighteenth century Prussia. The wider socio-political connotations of medical police were articulated by Andrew Duncan of Edinburgh in the following definition:

"the medical precepts which may be of use to the legislature or to the magistracy relating not only to the welfare of individuals but the property and security of nations, being perhaps the most important branch of general police, since its influence is not confined to those whose accidental circumstances bring within its sphere, but extends over the whole population of the state."(57)

The untrammelled expansiveness of Duncan's conception - which seems to represent something more sinister than agapistic 'bienfaisance' or philanthropy - entailed a phenomenal expansion of the sphere of jurisdiction in which the medical profession might legitimately operate. Another Edinburgh man, John Robertson, published the first notable treatise on the subject entitled "Medical Police, or, the Causes of Disease with the Means of Prevention: and Rules for Diet Regime etc. Adapted

Particularly to the Cities of London and Edinburgh, and Generally to All Large Towns" in 1809.(58) Despite auspicious beginnings, the public health movement was not highly developed by the mid-nineteenth century in Scotland.

In England the prevalent economic liberalism and 'laissez-faire' individualism did not, as we have seen, facilitate large-scale or comprehensive state intervention to promote public health. Only in exceptional circumstances, as when governments recognised contagion as a serious threat to social and political stability, was intervention seriously countenanced. After the legislation of 1834, the comprehensive responsibilities of continental and Scottish medical police passed into the vocabulary of Poor Law relief. State procrastination vis-a-vis intervention meant that the 'police' concept was transplanted in England in an attenuated form. By the late 1830s, sanitary and legal functions of medical police had been absorbed into the Benthamite administrative rubric of Chadwick's obsessive 'sanitary idea'. In 1844 Black delivered a series of lectures on the subject of public hygiene which suggested that medical police was confined merely to the regulation of the sanitary conditions of food, drink and the water supply.(59)

Only a small minority remained sympathetic to the broader, continental definition of the police concept.

Chadwick's own convictions endorsed a far more extensive commitment to administrative centralism and state intervention than had been realised by the time his career was rudely foreshortened in 1854.(60) Sir John Simon (1816-1904), who inherited Chadwick's mantle, accomplished far-reaching reforms in the field of social hygiene and public health.

Another committed reformer was Henry Rumsey whose "The Health and Sickness of Town Populations Considered with Reference to Proposed Sanitary Legislation and the Establishment of a Comprehensive System of Medical Police and District Dispensaries"(61) of 1846 resisted the tendency commonly advocated at the time to divide medical and sanitary responsibilities between different health officers. His support for a unified rather than divided medical service was more compatible with the continental inflection given to medical police.(62) His acclaimed "Essays on State Medicine"(63) published in 1856 drew upon both French and German experience of health policy to advocate specific recommendations such as the division of the country into public health districts, and the appointment of public medical officers. He insisted that

"upon the right ordering of a state provision for the medical care of the poorer classes in their own dwellings depend<ed> the stability and efficiency of the whole superstructure of the medical police."(64)

Rumsey's work was much attuned to the professionalist ambitions of Victorian medical men.

Trained himself as a doctor, Rumsey rejected aspects of Chadwick's Benthamite strategy which had irked the medical profession and provoked the antagonism of Wakley. Rather than allotting doctors a subordinate role to engineers in carrying out programmes of sanitary reform as Chadwick had done, Rumsey sought to render engineering the underling and handmaid of medicine.(65)

Unfortunately for medical men, in the aftermath of Chadwick's fall from power and the demise of a vigorous health lobby of the 1840s, the machinery to realise Rumsey's policy recommendations did not exist.

Overall, a deeply disunited medical profession and a climate strongly unreceptive to systematic health promotion demanding an extension in the sphere of governmental responsibility for social policy conspired to change the original meaning and scope of medical police. As MacLeod has correctly argued

"by the mid-nineteenth century, the earlier conception of a unified, centrally-controlled medical police was replaced by the dualism of the existing Poor Law Medical Service, and 'sanitary police' of Boards of Health. These twin services were the administrative pillars on which modern British medical policy pursued its own characteristic development."(66)

Despite the Herculean efforts of certain individuals endowed with a social mission which infused strength and purpose into the reform campaign, it cannot be maintained that the period 1815-1858 saw the fructification of the generic idea of medical police on English soil. Nor was medical education transformed to

bring it into conformity with the imperatives of the police concept. On the contrary, the tardy, unsystematic ad hoc manner in which British sanitary administration developed (customarily a pragmatic response to particular circumstances) was paralleled by belated recognition of the curricular relevance of social hygiene and public health. In England, St.Thomas' Hospital Medical School was the first to introduce a course of lectures on public health - delivered by Dr.E.H.Greenhow as late as 1856. Cambridge was the first University to offer a Diploma in Public Health in 1875. Originally, the course was to be titled 'State Hygiene'; its reformulation is a clear indication of how anathema the word 'State' was to Victorians at this time.(67)

The same reasons that forbid us from explaining the extension of public health measures in England during the first half of the nineteenth century in terms of the concept of 'medical police' also demand caution during this period about the uncritical, indiscriminate transference of Foucault's profound ruminations on the disciplinary function of medicine and the role of doctors in operating a 'jurisprudence of normalisation'.(68) Foucault's conclusions derived from his study of the French historical experience; only by the (illegitimate) stretching of the defining parameters of the concept of 'police' can the history of English public health before 1858 be twisted into conformity with such a theoretical framework.

Just as circumstances related to the particular trajectory of historical development assumed in England before the mid-nineteenth century render analogies to the continental police concept inappropriate, so the development of the modern state in England prevented medical men from forging a strategy of professionalisation in tandem with the state comparable to the more symbiotic relationship forged in some European countries.

Before 1858, such new administrative bodies as the Poor Law Inspectorate, the Prison Inspectorate, the Factory Inspectorate and the General Board of Health provided some Victorian doctors with salaried employment and the role of 'expert' sanctioned by the state.(69) Governmental enquiries on the employment of women and children, housing conditions, occupational diseases, sanitary conditions, public nuisances in towns, conditions in mines and factories, and the problems of medical education also created important roles for expert medical opinion. Yet the recommendations of government commissions which pointed in the direction of strong centralisation to accomplish reform flew in the face of the orthodox doctrines enshrined in contemporary political theory. Most reform proposals reaching the statute book were the result of pragmatic decisions rather than the product of the state's systematic fostering of the professionalisation of medicine. The profound philosophical reasoning which underwrote German

justifications for actualising the police concept was relatively underdeveloped in England and the degree of professionalisation more limited.(70)

Broadening the meaning of professionalisation beyond the simple enlargement of opportunities for remunerative employment to include autonomy over work, privileged status and the exercise of authority denied to lay outsiders implies that the mere enlargement of the sphere of public employment per se was no necessary guarantee of enhanced professional status. Whilst medical men remained subordinate to, controlled by, and dependent upon, lay employers in respect of their work, it cannot be claimed that they exercised full professional authority notwithstanding their exclusive possession of an esoteric body of knowledge incomprehensible to the layman.(71)

Background to the Medical Act.

The relationship between medicine as 'profession' and the state was newly defined by the Medical Act of 1858. The Act was the culmination of decades of agitation having been preceded by fifteen unsuccessful medical reform Bills and two Select Committees on Medical Education. The focus of the present discussion will be less upon the minutiae of each Bill and the personalities of the disputants than questions of sociological interest raised by the protracted campaign. Thus intra-professional conflict, different conceptions of the function of medical education for the trajectory

of professional development, the social implications of the Apothecaries Act, and the significance of state mediation for the long-term strategy of professionalisation are examined.

In October 1827 the Lancet published a radical editorial to stimulate debate over the vexed questions surrounding medical reform. "It is generally", conceded the editors, "a matter of great difficulty to effect a reform of any existing abuse. Descartes," they continued,

"inferred the fact of his existence from his rationality; but governments and legislatures, for the most part, assumed the converse of the Cartesian proposition, and infer the rationality of a system, from the fact of its existence. A system or institution exists, and has long existed, - therefore the system or institution is reasonable; this is the logic of legitimacy; this is the strong-hold in which the champions of existing institutions intrench <sic> themselves; this is the headgear on which they delight to find that the force of reason or philosophy can make no impression." (72)

The editorial, almost certainly written by Wakley himself, was intended to promote the speedy triumph of medical reform which it predicted was imminent on three grounds: first, the reform of abuses connected with the medical profession was eagerly demanded by the public; second, it was sought after by the great body of those medical practitioners to which reforming measures would be applied; third, because there was no indisposition on the part of the legislature to effect reform. The passage of the Medical Act over thirty years later was

neither 'speedy' nor 'triumphal' judged even against the most liberal criteria of interpretation. The chequered history of the medical reform movement suggests that only the Lancet's second reason for anticipating radical change in the political organisation of English medicine had any basis in the real climate of opinion surrounding the controversial political issues raised.

The overwhelming majority of general practitioners collectively sought change of some kind, but the populace remained indifferent to the problems of organised medicine, largely on account of the divorce between the 'science' regular practitioners espoused and its practical accomplishments. Differences dividing members of the legislature whose composition changed at every election proved more salient than what they shared in common.

The Lancet editorial itself hinted at the reasons why buoyant optimism concerning professional reform appeared to be at such variance with the temper of the reform movement during the next three decades. Seeking to discredit reactionary opposition to medical reform, the Lancet condemned two separate classes:

"the Bats, consisting of the society for the propagation of darkness, and the Pures, comprehending several variety of the same species, who <were> sufficiently disposed to support any change of system by which their own immediate interests might be promoted, but all of whom <were>, upon principle, opposed to a rational comprehensive scheme of reform." (73)

The critical political dilemma confronting reformers

was that sectional interests within the profession itself prevented the assertion of a united front to the general public on any significant issue: only on the vaguest and most diffuse question of society's 'need' for a highly educated class of medical men was there any widespread agreement. Radicals were resolutely opposed by the corporate elite - the focus of resistance to any attempt to undermine the established tripartite hierarchical order. Worse, centrifugal tensions from within denied reformers a strategic base from which to launch effective propaganda against their professional enemies and co-ordinate the political activity essential to the realisation of their objectives. Internecine strife within the wider reform movement was a deep register of the absence of that social solidarity over a range of fundamentals out of which a 'profession' has customarily been believed to have been forged.(74)

Some idea of the divergent interests that brought about conflict both between segments of the medical community who supported and those who opposed reforming measures, and amongst advocates of reform who differed profoundly about the precise form legislative action should take, was conveyed by Rivington in his acclaimed Carmichael Essay;

"efore the Medical Act of 1858 was passed by Parliament the grossest anomalies prevailed throughout the United Kingdom in the relative position of the Licensing Bodies to each other, and in the privileges of the various orders of Medical Practitioners. England, Ireland and Scotland

had different interests: the Colleges waged war against the Universities and at the same time were at variance both with the Apothecaries Societies and with each other. Exclusive privileges were possessed by the Medical Corporations, and special local jurisdictions in cities and provinces were assigned to them which none could invade without being exposed to a vigorous prosecution."(75)

The majority of medical men might unite in bitter condemnation of such 'gross anomalies' but not about the remedies appropriate for overcoming them. There was significant disagreement between reformers who challenged the authority of the established medical corporations in their role as examining and licensing bodies, and those who pressed for the suppression of unqualified practice as the most urgent desideratum for the well-being of the public and the profession alike.(76)

The first group were predominantly Benthamite philosophical radicals receptive to 'laissez-faire' sentiment directed against corporate monopolies and strongly advocated state intervention as a means of establishing national standards of qualification. The second group were more conservative; their demand for the proscription of unlicensed, irregular practice was quite compatible with compromise with existing structures, institutions and the vested interests supporting them.

Another source of internal dissension within the reformers' ranks was the divide between metropolis and

province. The principal discord was between the metropolitan elite and rank-and-file provincial practitioners, but animosity sometimes extended further. When, in the late 1830s, Wakley changed his formerly high opinion of Charles Hastings, criticising him for lukewarm commitment to the cause of medical reform, the tergiversations owed much to the metropolitan/provincial divide.(77)

Hastings studied medicine at Edinburgh under James Gregory and Andrew Duncan. Subsequently he established a developing practice in Worcester where he founded the Provincial Medical and Surgical Association in 1832(78): this institution was to develop into the British Medical Association in 1855. It was an avowedly provincial organisation from the outset, a response to the dominance of the capital in the affairs of English medicine. As announced in its first Prospectus the overriding goal of the organisation was to be the "Maintenance of the Honour and Respectability of the Profession, generally in the Provinces." Strong assertion of provincial independence from the capital was a major radical objective. The reaction it provoked threatened the survival and viability of the provincial venture in its first years. As one of the BMA's historians has correctly observed,

"the medical world was such that any new movement towards reform was liable to provoke hostility from among the contending factions already involved. The association was gaining support in the provinces; but

it was also gaining enemies in London."(79)

From the start the PMSA showed a serious concern for medical education, doctors' social status, and the achievement of professional aims by political means. Initially, radical objectives and a general antipathy towards the continued rigid separation of the three medical orders was sufficient to win the approval of the Lancet. On the establishment of the PMSA in 1832, Wakley referred to schemes put forward by the fledgling organisation as "masculine and comprehensive"; in a short epigrammatic formulation he epitomised the social mission of the PMSA and the wider reform movement as the building of "a foundation for the congenial union of scientific research and professional honour."(80)

Yet Wakley and the radicals were soon disillusioned with the PMSA's overly conciliatory attitudes towards the Royal Colleges, and transferred their political allegiances to a rival organisation called 'the British Medical Association'. Established in 1836, the new association was fronted by George Webster whose commitment to fundamental reforms and frontal assault on the medical elite was more uncompromising than the dulcet political tones voiced by Hastings and the PMSA. Webster urged the immediate reform of the medical corporations and the creation of "one great Faculty of Medicine for the whole United Kingdom, which could control medical education and practice and put down quackery."(81) Despite the support of the Lancet, these

demands failed to be met, Webster's 'BMA' proved short-lived and its title was taken over by its rival in 1855.

During the late 1830s and 1840s the organisation did represent a serious challenge to Hastings and the PMSA. The rivalry between these two reforming organisations was a typical product of the metropolitan/provincial axis. London's radicals expected provincials to follow their political lead and abrogate provincial independence in the name of reformist unity.(82)

Such a stance was anathema to an organisation whose explicit goal was the improvement of the lot of the provincial practitioner, and whose leader was publicly committed to the view that

"provincial medical practitioners <did> not hold the rank in the community to which they <might> attain, and to which it <would> at all times be the effect of <the PMSA> to stimulate them to aspire."(83)

By the 1840s a 'National Association of General Practitioners in Medicine, Surgery and Midwifery' organised by London general practitioner George Ross added another voice to the babel, advocating the establishment of a 'National Institute of Medicine' to counter Wakley's own proposal for a unified 'College of Medicine' acting as a licensing body for the entire profession.(84) Neither proposal bore fruit and while the movement for reform remained fragmented into distinct splinter-groups, so the enemies of socio-medical change were strengthened in their

reactionary efforts to channel or canalise it into politically acceptable directions. As with the Apothecaries Act before it(85), protracted wrangling preceded the enactment of the Medical Act, and proved a dramatic demonstration of the capacity for powerful resistance on the part of the old entrenched corporate elite to the rank-and-file's efforts to disperse professional privileges and authority more widely.

The Anatomy Act of 1832.

The campaign for registration was seriously under way by 1840, but in 1832 legislation was enacted which had established an important precedent. Early nineteenth century medical education was threatened with a crisis brought about by an acute shortage of cadavers.(86) Given that anatomy grounded on practical dissection was the bedrock of medicine, teachers were deprived of their most valued commodity. William Hunter, reflecting on his own experiences as a student of medicine, once recalled;

"I attended as diligently as the generality of students do, one of the most reputable courses of anatomy in Europe. There I learned a good deal by my ears, but almost nothing by my eyes; and therefore hardly anything to the purpose. The defect was that the professor was obliged to demonstrate all the parts of the body, except the bones, nerves and vessels, upon one dead body."

He further complained that there was "a foetus for the nerves and blood-vessels; and the operations of surgery were explained, to very little purpose indeed, upon a dog."(87)

Thomas Wakley encountered the same difficulty as a

student at the Borough Hospitals which imported French 'papier mache' models of the human body as substitutes for corpses. Students learned topographical anatomy by fitting together the appropriate part in accordance with coloured diagrams and wax models - disparagingly regarded by educators as extremely poor substitutes for human cadavers.(88)

In 1827 the Lancet condemned the apathy of the authorities who largely ignored the problem, and explained why remedial action was imperative. "The scarcity of subjects in the various anatomical schools of this metropolis," the editors complained, was "a matter of deep regret both with teachers and with students." Scurrilous resurrection men were by this time demanding extortionate prices for their grave-robbing. Some medical teachers paid, but this morbid trade did little to satisfy demand. According to the Lancet, only "an exceedingly small supply" of corpses could be obtained. "Lecturers and students being thus circumstanced," it continued,

"the cultivation of the science of anatomy <was> lamentably retarded; and if those who <were> desirous of becoming acquainted with this single foundation of medical knowledge <were> to be opposed and worried by so many obstacles and annoyances, it would not be surprising if they altogether abandon<ed> the pursuit."(89)

The consequences engendered by the serious scarcity of 'legal' cadavers extended beyond the sphere of medical education and clinical science. It was clearly

apparent by 1832 that the absence of any legislation to stem the tide of the resurrection men and the scandal of the Burke and Hare murders(90) had exacerbated the situation into a new pitch of crisis intensity demanding political intervention.(91) Medical schools in metropolis and province alike were the scene of extensive rioting as elements of the working class (whose relationship with the medical profession was strained at the best of times, and was seriously worsened by the cholera epidemic) vented their anger at the threat posed by the body-snatchers to a decent burial. The government faced an acute dilemma: defence of popular riots would antagonise the medical profession who insisted dissection was a critical aspect of medical education; but standing aside in favour of the status quo risked escalation of popular anger and public disorder.(92)

Since April 1828, a Royal Commission under the chairmanship of Henry Warburton had been investigating the problem, hearing evidence from leading medical figures like Benjamin Brodie, Joshua Brookes and John Abernethy, all of whom emphasised the indispensability of dissection. Wakley also testified, characteristically assigning the blame to the RCS whose bye-law of 1823 announced the non-recognition of dissection certificates except for work performed during the winter season. This action effectively swelled demand during the winter, raised prices and increased the profitability of grave-

robbing.(93)

Warburton first proposed a Bill in 1829 which provided for the selling of unclaimed bodies from the workhouses and elsewhere; but it was opposed by the Lords since it ignored the licensing of schools and failed to provide for a Christian burial of the remains.(94) It took further public outrage - at more 'anatomical murders', this time in London - to goad the authorities to draft further legislation. In 1831 Warburton introduced another Bill which met the Lords' previous objections. Despite Wakley's opposition, on the grounds that the hand of the RCS would be strengthened, the Bill became the Anatomy Act in 1832. Passed in the same year as the First Reform Act, this legislation established an extremely important precedent.(95) It had been actively campaigned for by philosophical radicals who, on Benthamite grounds, demanded state intervention to control the free market, to enhance the 'general interest' of the community, and further the interests of an important section of it.

As possessors and cultivators of science-based knowledge this preferential treatment meted out to doctors by the state was, for the medical Benthamites, wholly justifiable and meritorious. The legislation effectively terminated the ignominious reign of the resurrection men, but failed to prevent further outbreaks of popular violence directed against the medical profession.

Select Committees on Medical Education of 1834 and 1857.

Two years after the passing of the Anatomy Act, Thomas Wakley and Henry Warburton, Benthamite-leaning MP for Bridport, successfully inaugurated a movement for the systematic reform of medical education by procuring the establishment of a Select Committee on Medical Education.(96) Under the latter's chairmanship, the committee undertook "to enquire into and consider the laws, regulations and usages regarding the education and practice of the various branches of the medical profession in the United Kingdom." (97) The SCME gave reformers a public platform through which to expose the evils and malpractices of contemporary medical education, and heighten awareness of corporate abuses.

The committee amassed copious evidence and published three reports in 1835 relating to the Royal College of Physicians, the London College of Surgeons and the Apothecaries Company. A fourth volume devoted to evidence collected from provincial practitioners, from the universities, and from medical men in Scotland and Ireland, was not published.(98) The Report did not reflect well on the corporate elite who formally governed the republic of medicine. Conversely, the Report redounded to the credit of Wakley and Benthamite reformers whose sustained attack on "the dull feeble exclusiveness of the Royal College of Physicians of London, the tyranny and ineptitude of the Royal College of Surgeons, the pettyfogging malice of the Society of

Apothecaries ..."(99) was revealed to be more than just propaganda.

From a utilitarian standpoint, the authorities of the Royal Colleges condemned themselves out of their own mouths. Sir Henry Halford, President of the RCP, for example, openly admitted that "the dignity and respectability of the profession"(100), far more than the advancement of medical knowledge or science was his overriding concern. In his estimation, the provision of instruction in medical science was not the function of a physician's education; it was of small consequence that few fellows of the RCP had published scholarly treatises on the most recent developments in the field.(101) As Sir William MacMichael, the King's Physician, informed the committee, it was "not so necessary to write great works" at that time, for "the science <had> advanced so much, that it <was> not to be expected that <physicians> should have very voluminous publications."(102)

As for the College of Surgeons, evidence submitted to the SCME confirmed what many already knew - that it was governed by an avaricious, self-serving and self-perpetuating clique, utterly indifferent to the complaints and requirements of its membership. Typical of this attitude was the persistent and obstinate refusal of the College to recognise the practice of midwifery as a legitimate aspect of the surgeon's craft, in spite of its having become a routine element of general practice. George Guthrie for example, Councillor

of the RCS, scorned surgeons who practised midwifery, telling the SCME that "with all possible respect for this class of gentlemen, I must say, that I should be exceedingly sorry to see the first accoucheur in this town president." (103) At stake in the eyes of the college authorities was the purity of surgery as a profession equivalent in status and prestige to the profession of physic. Judged by such criteria, the vulgarities of midwifery (a form of manual labour that the rudest apothecary could perform) represented a danger to be averted at all costs.

However much the Royal Colleges were discredited by evidence submitted to the SCME, its recommendations were only advisory. It concluded with a broad endorsement of one of two possible strategies to accomplish reform. The first, which was not recommended, entailed the organisation of the profession into classes or gradations of skill, subsequently basing qualifications around these gradations. The second, which was endorsed, was the reverse of the first in that qualifications were regarded as prior and their possession formed the basis for classes and gradations within the profession. (104) Notwithstanding detailed revelations of abuses on the part of medical corporations, and the cogency of the committee's proposals, over a quarter of a century was to elapse before reform was embodied in legislation.

In 1847, by which time seven Bills on medical reform had been submitted to the legislature, another Select

Committee under the chairmanship of Henry Warburton was appointed to examine the complex problems of medical education and registration.(105) Where the first revealed widespread evils surrounding the educational provision of the medical corporations, the second exposed the prevalence of unlicensed and unqualified practice, which appeared to inhibit the development of order and unity within the occupation. A mass of evidence was again submitted, recorded and published, but no official report was drafted despite the original intention to do so.(106)

The evidence disclosed the resilience and tenacity of the social objectives of the Royal Colleges, which stood steadfast against change in the direction of equality or justice for rank-and-file members. One spokesman for the RCP was anxious to emphasise to the SCMER

"the great advantages which result<ed> to society from there being an order of men within the profession who <had> had an education with the members of the other learned professions; from a certain class of the medical profession having been educated with the gentry of the country and having thereby acquired a tone of feeling which is very beneficial to the profession as a whole."(107)

Francis Hawkins, Registrar to the College, echoed this sentiment in expressing his wholehearted opposition to uniform registration within the medical profession. He informed the Committee that

"if the registration were to be formed upon the the principle of their <the three orders of the profession> being placed together, it would tend to destroy those distinctions

which <had> been found to be beneficial to the whole profession, and also to the public."(108)

Nor had the Royal College of Surgeons wavered from its unflinching commitment to preservation of the three professional orders and internal stratification within them. William Lawrence, as President of the College and apostate of radical reform (having earlier collaborated with Wakley to advance the cause of the general practitioner) spoke of "those levelling principles of equality" which, in his view, had been "found to be injurious wherever they exist<ed> in practice."(109)

George Guthrie, Councillor and former President of the College by 1847, testified that his opposition to uniformity within the profession remained as determined as it had been before the 1834 Committee. Guthrie declared that he was not opposed to a register of qualified practitioners per se, but insisted that "they should be kept distinct as to their being physicians or surgeons, or surgeon-apothecaries."(110) Guthrie doubtless spoke for the entire elite of the Royal Colleges when he explained the origin of their resistance to the single register demanded by the radicals. Only a certificate testifying that a practitioner was qualified as a physician, a surgeon or a general practitioner, was acceptable to Guthrie. Uniform non-specific registration, however, was exactly "what the colleges objected to, as pounding us all up in

the same mortar."(111) Yet for another decade, whose later stages have been characterised as "the period of confusion"(112), any substantial 'pounding' of the old elite by 'parvenus' elements from among the rank-and-file was postponed; and when it eventually materialised in the legislation of 1858, it did so in an extremely attenuated form.

Socio-Medical Consequences of the Apothecaries Act.

Enough of the mood, temper and direction of the medical reform movement has been evoked to grasp that it squares uneasily with the optimistic or progressive interpretation of the Apothecaries Act of 1815. This interpretation, the received wisdom among medical historians before Holloway's 're-interpretation' was put forward, likened the Act to the great Reform Bill of 1832 as forward-looking legislation that paved the way for the emancipation of the modern medical profession from the tutelage of the ancient orders and the social constraints of the 'ancien regime'.(112)

Brotherston neatly encapsulates the assumptions of the older, naively whiggish interpretation of the Act as follows;

"<t>he earlier emergence of the apothecary as a prototype general practitioner was given statutory force by the Apothecaries Act of 1815 which enabled the Worshipful Company to give form and substance to an appropriate education for the emergent practitioners. Coinciding with the general movement of reform and change in professional institutions to meet the needs of a prospering industrial society, and the desires of an enlarging middle class for

appropriate careers for their sons, it helped to promote the emergence of a new class of better-educated practitioners who later would be active in the movement for medical reform."(113)

Other scholars have been likewise impressed by the eufunctional consequences of the Act for the subsequent emergence of modern professionalism in English medicine. Carr-Saunders and Wilson directly attributed the renaissance of medical education between 1815 and 1858 to the stimulus of the Apothecaries Act.(114) This standpoint was reinforced by Cope's argument that both metropolitan and provincial medical education improved greatly in the subsequent decades(115); while Bishop has been so far as to describe the passage of the Apothecaries Act as "a great landmark in the history of the general practitioner."(116)

However, as Holloway has argued, the thesis that this legislation ushered in a new medical epoch consonant with the assumptions of modernisation theory depends upon the validity of two assumptions. First, it depends on the view that the Society of Apothecaries administered the provisions of the Act efficiently, raising academic standards. Second, it rests on the claim that since the foundation of new metropolitan and provincial medical schools dated from the period immediately after the Act, the schools were therefore brought into existence to meet the demands of candidates seeking to pass the examinations of the Apothecaries

Company as specified in the legislation.(117)

Yet on the first issue, the Apothecaries Society proved to be satisfied with relatively elementary educational levels; and the Act's notorious apprenticeship clause severely hampered the Society's limited attempts to improve the general education of its candidates for the diploma, ultimately reinforcing the lowly status and perpetuating the subordinate occupational role of the apothecary. On the second issue, it is one thing to draw attention to the importance of the proliferation of medical schools in the aftermath of the legislation of 1815, but quite another to conclude that the Apothecaries Act was therefore the direct cause (rather than mere precursor) of that proliferation - a crude example of a post hoc ergo propter hoc fallacy.(118)

Judged against the particular socio-economic and political goals of those who fought hardest for legislative reform to benefit the regular practitioner, the Act of 1815 must be reckoned a failure. It did nothing to stem the tide of irregular practice which continued to flourish. It underlined the retail function of the apothecary as a mere trader, dispensing drugs at the behest of the physician, thus undermining the former's pretensions to the status of a learned profession. It allowed chemists and druggists to continue to undercut the apothecary's work. Above all, it perpetuated and appeared to ossify the tripartite

hierarchy whose desuetude was the historic mission of the general practitioner to accomplish.(119) Far from offering the subordinate medical orders any kind of olive branch with which they might improve their relative position within the internal hierarchy, the terms of the Act effectively reinforced the hegemony of the College of Physicians which stood - undisputed sovereign body within the republic of medicine - in splendid isolation from, and with an attitude of aristocratic indifference to, the 'gamin' preoccupations and activities of its subordinates.

Overall, it is difficult to dissent from one of Holloway's principal arguments that the Apothecaries Act of 1815 had "closer affinity to a Stuart patent of monopoly than to a statute in the age of 'laissez-faire'".(120) For insofar as the Act's real importance resides in its specific effects upon the education of apothecaries (rather than in the politic way the College of Physicians manipulated the legislation to consolidate its position of precedence within the profession), the monopoly bestowed upon the Society of Apothecaries worked to the long-term disadvantage of the emergent general practitioner.(121) Conferring on the Society an exclusive right to examine and license apothecaries throughout England and Wales was not conducive to the 'modernisation' of general practice, nor the 'professionalisation' of the general practitioner.

As one anatomy teacher reflected on the issue of

medical reform three years after the legislation of 1858; "<t>he greatest evil from which the profession was relieved by the Medical Act was the monopoly possessed since 1815 by the English Apothecaries Society."(122) He believed the Act was unjust to all the licensing bodies, and especially harsh on Scottish students. Even aside from the monopoly, John Struthers argued the Act was 'positively injurious to the profession': it defined medical practice as drug-giving; the very name 'apothecary' was certain to lower the profession in the eyes of the public; it retarded the progress of 'scientific' medicine; and the five-year apprenticeship clause deprived the aspiring apothecary of a critical period during his early years which ought properly to have been devoted to general education. "When it was said", Struthers perceptively observed,

"that the Apothecaries Act of 1815 <had> been of service in securing that every person practising Medicine should possess a complete medical as well as a surgical education, it seem<ed> to have been forgotten that the right method of accomplishing this was just as the Medical Act has now done, simply to have acquired a legal qualification in Medicine; without giving a monopoly to any one body, and least of all to a commercial society of apothecaries"(123)

Only when the general practitioner recognised that the Society of Apothecaries was, in Struthers words, "unfit by nature to serve as the portal to a liberal profession"(124), and work to liberate himself from its Promethean shackles, would he transcend his image as

lowly apothecary, trader and 'physician's cooke'.

Clearly the connection between the Apothecaries Act of 1815 and the subsequent reform of medical education was far more tenuous than the earlier 'progressive' interpretation suggested. Far from marking the alleged "zenith of the apothecary in history"(125), the Act largely worked against the general practitioner by confirming his subordinate role within the professional hierarchy and by obtruding his efforts to raise his status to that which ought to obtain to an 'educated' man whose work was premised on the assumption of salus populi suprema lex.

Having accepted that the reactionary character of the legislation must remain uppermost, the 're-interpretation' of the Act demands some qualification. The Society of Apothecaries was encouraged to pioneer the introduction of expressly written examinations by the terms of the Act.(126) Given the critical historical significance of examinations, both as a means whereby channels of upward social mobility might be open to 'ability' and 'industriousness', and also as a basis for a 'disinterested' and 'objective' definition and assessment of expertise, the legislation of 1815 - in this sense at least - represented a genuine break with the past. The Act's provision for a national qualification was to prove valuable as a resource for rank-and-file practitioners to deploy against monopolistic elites with whom, however, the power of

granting qualifications remained for decades.(127)

Judged alongside the corrupt and obsolete educational practices of the Royal Colleges, the Society of Apothecaries was at least impartial in the way it administered examinations and conferred qualifications. Between 1815 and 1833 the Society examined 6,489 candidates of whom 5,769 were successful.(128) The example set by the Apothecaries in this respect may well have galvanised the College of Surgeons to reform its own examination requirements and administer them more rigorously. Reader has contended that

"by 1834 the Apothecaries System ... <had> no doubt reacted sharply on the Surgeons, who also set about tightening up their educational requirements and examinations."(129)

The marked increase in the number of practitioners possessing the double qualification (LSA and MRCS) is the critical factor here. During the decade after 1824 the College of Surgeons granted 3,902 diplomas and the Society of Apothecaries 3,782 certificates, thus revealing, as one witness divulged to the SCME in 1834, "that general practitioners do pass both examinations, and substantially to practise surgery as well as medicine."(130) The most tenable 'progressive' reading of the consequences of the Act would be to emphasise how the legislation accelerated the process of disintegration at the level of social action (however much it petrified the hierarchical pyramidal structure)

of the formal tripartite order as long-hallowed distinctions between the surgeon and the apothecary broke down giving rise to a qualitatively distinct type of practitioner who was to give so much impetus to the reform movement. As Peterson has argued on the subject of the blurring of distinction between the two lower branches of the profession:

"<w>hat had been occasional, informal practice before 1815 became institutionalised after the Apothecaries' Act among the rank-and-file of medical practitioners, and the evolution of the general practitioner, duly licensed, whose place in the profession was defined in terms of function rather than corporate affiliation, was well under way."(131)

In the last analysis, however, men like Wakley and his fellow protagonists of radical reform had the most acute perception of the long-term political repercussions of the Apothecaries Act. All their strenuous efforts to emancipate the general practitioner from the tutelage of the corporations were a testament to the profound imperfections of the Apothecaries Act judged as a reforming legislative measure. The Act instituted no competent examination for midwifery, provided no basis for accomplishing the legal separation of pharmacy and medicine (allowing druggists to continue to dispense the prescriptions of physicians and even to establish their own alternative practices), and set in force no authority with powers to penalise or proscribe irregular practitioners during 'the golden age' of the quack. These were the 'abuses' which served as the

rallying-cry for medical reformers.(132) It is all too apparent that Poynter's judgement that "<i>t was because the 1815 Act was so successful that the reform movement and the 1858 Act followed"(133), is not merely untrue, but the direct obverse of the truth. Such an egregious judgement in fact makes the politics of the medical reform movement between 1815 and 1858 utterly unintelligible either from an historical or sociological standpoint.

The Passage and Terms of the Medical Act of 1858.

The involved, complicated stages preceding the enactment of the Medical Act have been extensively documented elsewhere and require no further elucidation.(134) Our concern here is with examining the extent to which the wider objectives of reformers in respect of medical education were advanced by this legislation; and with how the socio-medical changes which underpinned the Act transformed the political context of the emergent relationship being forged between the medical profession and the state.

By 1857, the year before the legislation finally reached the Statute Book, the confusion and heterogeneity of interest groups within the medical reform movement had resolved into two major factions and one other marginal group. The first aligned itself with Mr.Headlam, whose proposals combined a demand for a representative independent medical Council with preservation of the tripartite hierarchical 'orders' and

an examination system involving both the Colleges and the Universities. The composition, status and powers of the Medical Council had become the principal bone of contention between different groups. The second rival faction aligned itself behind Lord Elcho who demanded a nominated Council answerable to the House of Commons, and a single portal of entry into the profession. A smaller group fronted by Mr. Duncombe, heir to Wakley's radical mantle, remained unshakably opposed to the survival of the three medical corporations and strongly committed to equality throughout the profession.(135)

In the event, W.F. Cowper and John Simon exerted the most direct influence on the shaping of the final draft of the legislation. At the end of 1857 Cowper, then President of the Board of Health, Vice-President of the Privy Council's Committee for Education, and Chairman of the most recent Select Committee on Medical Education, announced his intention to introduce a Bill which he put forward in March 1858. Like Headlam's proposals before it, Cowper's scheme was moderate and conciliatory in tone, falling well short of realising Wakley and the radicals' demands. Cowper's proposals were directed to the establishment of a Council composed of representatives nominated by the corporations and the universities, and the retention of certain diplomas as the basis for licensing. More than any of its predecessors, Cowper's Bill managed to unite different

interest-groups, but further modifications ensued before enactment.

The critical issue of the last stages of legislative reform was whether the Council, whose existence was recognised as essential by all the parties, should be constituted on a representative or nominated basis. The views of John Simon(1816-1904), who assisted Cowper in drafting the Bill were particularly important here. Simon(136), had succeeded Edwin Chadwick as Medical Officer to the Board of Health, following the latter's fall from power in 1854. His distance from his predecessor's relatively limited views on sanitary engineering made him a more valuable ally of the medical profession.

In 1842, Simon published his views on medical education and licensing, advocating a single common standard of education for all prospective doctors, and a single administrative structure as the most effective means of bringing about reform.(137) Simon's own predilections were radical: he favoured a General Council with real and substantial powers to regulate the qualifications requisite for inclusion on a single register, and the proscription of irregular or unorthodox practice. If necessary, Simon wanted the Council to have enough clout to compel licensing authorities to combine their powers, or even to set its own examinations.(138) The Royal Colleges were suspicious of proposals seen to threaten or undermine

their interests; and a change of government (from Palmerston's Liberal to Lord Derby's Conservative Ministry) obliged Cowper and Simon to compromise.

The Act passed in 1858 included the following major provisions. A General Council of Medical Education and Registration was instituted, but without the extensive powers envisaged by the radicals as embodied in Simon's initial proposals. Under the terms of the Act, the GMC (as it subsequently became known) was empowered to make orders and regulations for the approval of the Privy Council and carry out certain functions: the establishment and maintenance of the register; the definition of degrees, diplomas or other qualifications necessary for assessing the suitability of candidates seeking admission to the register; the right to demand the co-operation of examining bodies; the appointment of examiners; the administration of a disciplinary code enabling the Council to expel doctors for unprofessional conduct; and the maintenance of an official Pharmacopoeia.(139) Regional licenses (a long-standing inheritance from the medieval period whose anomalies stemmed from the survival of variegated local guild traditions) were abolished by the Act. Subsequent to this 'modernising' and 'rationalising' clause, any qualification recognised on the register was valid and legitimate throughout the United Kingdom.(140)

Yet what was left undone and unchanged by the Act is even more germane to its long-term historic

significance. First, the General Council was more restrictive in scope and in the powers it possessed than had been canvassed for by the majority of the reformers. Simon's Bill was modified to accord only advisory powers to recommend curricular changes.(141) It was denied the power to compel the various licensing bodies to change their regulations(142), and had the capacity only to inspect the examinations rather than regulate them in accordance with a uniform scheme imposed by the Council. Even the very composition of the Council was a disappointment to reformers as it bore no relation to their vision of a representative body appointed entirely by, and answerable to, the profession itself. Not only the medical corporations but the Crown and the universities were represented on the Council; any notion of direct democratic elections to important positions on the Council was ruled strictly out of court.(143)

To the chagrin and dismay of the radicals, the Act of 1858 did not prohibit unqualified medical practice or bestow the monopoly they wished the state to confer upon regular practitioners.(144) Parliament discouraged the practice of quacks by denying them the right to sign statutory certificates and to prescribe dangerous drugs, but did not eliminate them by legal proscription. If the bulk of regular medical men sought to secure for themselves "a closed shop with an Act of Parliament to lock the door"(145), they were denied the statutory sanctions against the unqualified demanded to make it

effective. All the radical reformers managed to wring from a recalcitrant Parliament was a Council that could, if it wished, impose a fine of twenty pounds on any person falsely representing himself as a qualified doctor, and likewise prohibit unregistered practitioners from gaining employment under the Crown.(146)

Nor was the critical principle of a 'single portal' of entry into the profession embodied or given credence to in the legislation of 1858. Those, like Alexander Harvey, whose overriding objective in the reform of medical education was "assuredly ... to secure, in return for a uniformity of professional privilege, a corresponding uniformity of professional qualification, all over the kingdom<sic>"(147) were aggrieved at the Act's failure to accomplish this oft-voiced demand. The policy of one portal of entry was explicitly rejected; the corporations' diplomas and degrees survived the legislation of 1858 intact and in all their diversity; nor was there any insistence on the triple qualification in medicine, surgery and midwifery at this time.(148)

Most humiliating of all for the radicals was the Medical Act's failure to significantly affect the privileges, powers, and internal structure of the ancient corporations, despite the new legal framework. The injurious hierarchies radicals had fought to dethrone and replace with more democratic and representative alternatives were preserved and perpetuated by the Act.(149) Wakley's own reaction to

the events of 1858 and the legislation that bore fruit that year was understandably ambivalent. "After a struggle of thirty years", he wrote,

"it is something to have advanced a single step in the right direction; it is an important one, and only the first ... As a beginning we hail it as a great boon; but we only regard it as the commencement of a series of important stages."(150)

If anything, Wakley's opinion represents an over-statement of the achievements of the Act from the perspective of the rank-and-file medical men whose interests Wakley had sought to advance - a hyperbole necessitated as a face-saving exercise. In reality, the Act's provisions represented the maximum concessions which elite vested interests were prepared to grant. Only marginally did the legislation serve to enhance the social and professional status of the ordinary general practitioner.

A Critique of Previous Interpretations of the Medical Act: The Emancipation of Victorian Doctors?

The Medical Act of 1858, like the Apothecaries Act before it, has been erroneously portrayed by medical historians as representative of a genuine, large-scale peripeteia in the historical development of English medicine. The customarily obsessive preoccupation of medical historians with progress has led to a greatly exaggerated estimate of the historical discontinuity represented by successive Acts of Parliament, and therefore, a fundamental mystification of the social

and economic changes which are the real motor of medical history, and to which particular legislative watersheds are a response not a cause.

Some of the hyperbolic assessments of the historic importance of the Medical Act are exemplified by the following. Newman judged that the legislation marked "the beginning of the modern development of medical education in the British Isles." (151) For Vaughan, the Act was not merely "a landmark in the history of the British Medical Association", but also "a landmark in the social history of this country." (152) The Parrys have adopted a similar metaphor to contend that the Act was "a major landmark of the apothecary and of the surgeon from their lowly status of tradesmen and craftsmen and their assimilation into a unified medical profession with the higher status physicians." (153)

Brotherston has argued that contemporaries themselves shared this optimistic vision of the Act, whose "outstanding achievement" was "the official unification of all the medical castes and septs into one profession of registered medical practitioners." (154) Rosemary Stevens believes that the Act was "the best friend of the general practitioner" on the grounds that it created one profession and provided them with a state-sanctioned monopoly over medical practice. (155) Even Holloway, whose originative 're-interpretation' of the Apothecaries Act of 1815 has broadly found endorsement here, reasoned that because the Act of 1858

introduced a single register, it therefore "end<ed> the rigid hierarchical division of the profession." (156) And Larson, in accordance with the tenets of historical materialism, has contended that the Medical Act was a watershed in the history of the class relations of the period. In the context of a discussion about "the movement by the 'lower' corporate orders of England against the entrenched upper-class physicians", she argues that the victory of the former over the latter "with the Medical Act of 1858, can be interpreted as a victory of the middle class against aristocratic privilege." (157)

All these different interpretations of the Medical Act are to some degree misleading. Those who see the legislation as a modernising measure which transferred power from the old elite to that ultimate cliché of history, the rising middle class, underestimate the strength of the corporations on the Council and the absence on the same of representation for rank-and-file graduates and licencees. If the passage of the Act represented a victory of the rising bourgeoisie against the aristocratic elite of the 'ancien regime' it was an extremely Pyrrhic one. As for the legislation ushering in a 'nouvelle époque' for a united medical profession with its old hierarchies and antagonisms transcended, I have argued that the breakdown of the tripartite hierarchical order was underway at least a century before 1858; that its origins lay ultimately in the

social pressures set in motion by the development of capitalist industrialism; and that its breakdown was already being succeeded by a new hierarchical structure (of consultant physicians and surgeons on the one hand and general practitioners on the other) which long inhibited the homogenisation of the profession. The principle of hierarchy within the profession and the power base of the metropolitan elite were given a new lease of life rather than transcended or eliminated by the Act.

Some contemporaries, pace Brotherston, were acutely aware of the severe limitations of the Medical Act from a professional standpoint. William Stokes, Regius Professor of Physic at the University of Dublin and one of the most powerful leaders of the profession, observed in 1864 that

"<f>or many years previous to the passing of the Medical Act in 1858, the profession <had been> agitated by the struggle for medical reform; and among the evils complained of <had been> the want of a fitting position for Medicine."

Yet the Act, Stokes argued, had "as yet done little for Medicine in <that> respect." (158) Although the GMC had been brought into existence by the Act, Stokes realised that,

"as touching the social position of the profession, it <was> but too obvious that the leading idea of the promoters of the Act was more the protection of the various licensing bodies in the exercise of that craft by which they had their wealth, than the placing of Medicine on a level with its sister faculties by the enforcement of

a large and liberal education."(159)

The original Act of 1858 consisted of fifty-six clauses, to which five more relating specifically to medical education had been enacted by amendments at the time of Stokes' lecture. He complained, however, that

"these clauses were introduced after the passing of the Act in the House of Commons for the protection of the most miserable quackery that ever soiled a noble calling."(160)

The crux of Stokes' complaint was that the GMC had been established with insufficient powers to effect the radical changes still demanded in the system of medical education. Stokes' viewpoint was reinforced by that of Henry Acland, another extremely powerful figure in Victorian medical circles, who told a Select Committee of Parliament in 1879 that under the Act of 1858, the powers of the medical Council were "really very limited."(161)

Medical Education and the Role of the GMC.

In view of such limitations, it is important not to exaggerate the capacity of the GMC to effect far-reaching reform of the system of medical education. Stella Butler has argued in a recent paper that the activities of the GMC's Educational Committee and the curricular changes it sought to implement were critical factors making for the professional maturation of Victorian medicine, and played the dominant role in the large-scale transformation of medical education in the second half of the nineteenth century.(162)

Admittedly, its earnest deliberations over the formidable educational problems consequent upon the phenomenal growth of bio-medical knowledge, the increasing pace of specialisation and the questions its apparently remorseless expansion posed for the survival of generalist culture stimulated debate. The GMC's endorsement of practical heuristic instruction in the laboratory sciences, its emphasis on physiology as an experimental science separate from anatomy, its condemnation of apprenticeship as an improper avenue of entry to the profession, and its sanctioning of the separation of pre-clinical studies from hospital practice certainly exerted some impact on the modernising and professionalising processes which are our principal concern.(163)

Yet the extent to which the GMC's prescriptions merit explanatory primacy remains debatable and needs to be kept in proportion, mainly on account of the limitations of its formal powers which circumscribed its sphere of influence. The power to bestow licences remained with the corporations; and insofar as the GMC possessed 'powers' as such, they were supervisory and advisory. After the 1858 Act, the GMC was permitted to inspect examination procedures, it was chary and nervous of so doing and, in the event, sent deputies rather than representatives.(164) Visitations were long-winded and expensive. At St Bartholomew's the GMC inspectorate was simply refused admission to the medical school.(165)

It is also far from certain that "Council members' views reflected the contemporary high regard for scientific naturalism of many notable intellectuals such as T.H.Huxley."(166) Those who dominated the decision-making processes of the GMC were more likely to be eminent clinicians educated at Oxford and Cambridge who saw themselves as elite cultured literati, quite different in many respects from Huxley's less aristocratic, more aggressively 'bourgeois' scientific circles.(167)

Henry Acland, for example, though an effective spokesman for the cause of modern physiology(168), remained a staunch Anglican throughout his life and was extremely suspicious of the cosmology of scientific naturalism as propagated by Huxley. As President of the GMC, Acland's primary objective was to infuse the traditional Victorian idea of the 'Christian gentleman' into the medical profession. As recorded in the GMC minutes of 1887, Acland explained that the Council's principal concern was with "the foundation of the better medical mind", which could only be acquired through "the discipline and development of all the higher faculties."(169)

Quite the reverse of Huxley's predilection for relegating classical studies and general education to a subordinate position below science and transforming the latter into the very basis of 'liberal' education, Acland sought to preserve the traditional notion of the

scholarly, broadly-educated, cultured 'profession'.

Hence the 'higher faculties' to which Acland referred needed to be cultivated by medical students "before they <were> restricted to scientific and technical studies." (170) Henry Acland was readily identifiable as a leading and self-conscious member of the medical elite which, in Lawrence's words,

"stressed the value of classical and general education rather than a narrow and technical one, and praised the attainment of character more than the pursuit of expertise." (171)

William Stokes was emphatically another member of this extremely powerful elite. In his capacity as outgoing President of the BMA in 1868, Stokes expressed the view that the fundamental desideratum of medical education lay in "seeing to the moral and religious cultivation and the general intellectual advancement of the student." Higher ethical and religious standards, in Stokes' view, would eliminate "a certain order of candidates" from the ranks of the profession. As with Acland, the goal Stokes sought to promote by this public declaration in support of strict moral and religious conduct is evident: Stokes affirmed that the exclusion of a lower class of practitioner would conduce "greatly to the advantage of <the profession's> social position in the country, and the interests of science and the public at large." (172) The cultural predilections of men such as Acland and Stokes (many of whom, like them, were actively involved in both the BMA and the GMC) squared

uneasily with the remorseless scientific naturalism of Huxley and his associates in the 'X' club. Butler is aware of the shift, on the part of the GMC elite, from an emphasis upon the doctor as a scholarly academic versed in high and general culture to a more scientific pedagogy, but tends to underestimate the longer-term significance of the former in circumscribing the emancipation of the latter.(173) A moderate revision of the GMC's role in the transformation of Victorian medicine is perhaps called for, and with it, a more sober assessment of the historic discontinuity represented by the passage of the Medical Act in 1858. The Medical Act, Professionalisation and the State Concluded.

Just as reformers' demands between 1815 and 1858 were an index of what the Apothecaries Act had failed to accomplish, so the clamours for further reform culminating in the Medical Amendment Act of 1886 grew out of radical disillusionment with what had been secured by the Medical Act of 1858. Many anomalies survived and the composition of the medical profession remained heterogeneous. The British Medical Journal drew its readership's attention in 1867 to the deleterious consequences of the survival of so many anomalies into the post-1858 period.

"One tenth of the whole number of practitioners of the country are practising under a diploma given without examination in medicine, materia medica or botany, and without any kind of clinical test whatever -

that of the Royal College of Surgeons in England. Nearly one fifth are practising with a surgical diploma only (obtained from various sources) which would not be accepted by the Poor Law Board, by the authorities of the army and navy, or others, as alone qualifying them to treat the persons under their charge; and which would not allow them to recover fees in a court of law for attendance or medicine in any other than purely surgical cases. Of course only a small proportion are practising pure surgery. In respect to medical degrees, the numbers are not quite so large; but there are 577 practitioners holding only the diploma of the Apothecaries Hall of London, which does not imply of necessity any knowledge of surgery, or any adequate knowledge of anatomy ... It will assuredly not fail to attract very serious attention, that upwards of 5,000 out of a total of 29,000 practitioners are not qualified by law to practise more than one department of their profession."(174)

The continued existence of so anomalous a system of professional qualifications stood - judged from a radical Benthamite standpoint - as a glaring indictment of the Medical Act.

Even at the turn of the nineteenth century, spokesmen for the interests of the general practitioner were still calling ruefully for the same single portal system of examination demanded half a century earlier. Nelson Hardy's Carmichael Essay of 1900 made reference to the problem:

"<t>he history of the efforts made during the last twenty or thirty years to introduce this much-needed reform shows once more how vested interests can and do prevent the carrying out of public improvements, even when the necessity for these has been fully recognised by those most competent to judge."(175)

The principle of public utility had been repeatedly endorsed, but not fully embodied in the legislation enacted. The Medical Act of 1858 was only a first step towards large-scale reform: had it genuinely revolutionised medical education, as many historians have supposed, it could scarcely have led to what one scholar has somewhat incongruously described as a "Thirty Years War" to achieve further reform between 1858 and 1886.(176)

To restore some sense of balance, however, the legislation of 1858 did bring into existence a single national register which embodied the principle of equal recognition of all legitimate practitioners before the law. Inasmuch as the Act formally recognised the existence of a body of licensed, qualified doctors and announced its importance to the state, it did represent a significant historical first. One historian has argued that the GMC established in 1858 was also a critically important innovation:

"<i>it was the first body set over any British profession in which there sat members appointed by the state to take part in the regular routine of <its> functions. Yet, although the state created it, it was not an instrument for carrying out the will of the state ... The official nominees were a small minority among the members ... Thus the first national measures to supersede the system of chartered liberties in the medical profession were unlike any other professional constitution in the British Isles ... in not merely permitting but presupposing the existence of strong voluntary associations side by side with the official machine."(177)

The phenomenon of dualism was itself delicately interwoven with the wider professional dilemma posed by state intervention in the age of classical Victorian liberalism. The preamble of the Medical Act declared it was "expedient that persons requiring medical aid should be enabled to distinguish qualified and unqualified practitioners" asserting that the GMC's entire functions "flow<ed> from that original objective." (178) This explicitly contravened the 'laissez-faire' elements of Victorian liberalism. The hallowed doctrine of caveat emptor in the market place was breached because it threatened to undermine the profession's claim to serve the public interest by eliminating irregular 'quack' practice. The broad thrust of regular practitioners' strategy was to assert that because doctors offered the general public services rather than goods, the free-trade principle was ipso facto inapplicable. The ideology crystallised in the pursuit of this professionalist strategy entailed the construction of a doctrine of patient ignorance and dependence on the professional services only 'qualified doctors' could provide. (179)

The 'disinterested', 'objective' and 'rational' authority of the state was invoked to stamp this professionalist ideology with a mark of legitimacy and universality, whilst conferring, at the same time, quasi-monopolistic privileges on those recognised by, and registered with, the state. Because the legislation

of 1858 provided for "an unprecedented participation of the English government in medical affairs"(180), they necessarily betokened a new framework in which a different relationship between the profession and the state would be established. The nature of the relationship thus germinated suggests the Medical Act was less about protecting the public from the unscrupulous than realising for the profession itself competitive advantages in the market-place and a favoured social position in the hierarchies of Victorian England. The principles of salus populi or salus societatis were to prove conducive to the advancement of salus medici.

A Retrospective Summary: Science and Professionalism in Three Contexts.

In the last two chapters we have examined three related but different contexts in which Victorian medical men were able to deploy their 'scientific' knowledge about disease and its treatment towards the end of accomplishing a variety of socio-economic and political goals whose complexity is betrayed by the general term 'medical reform'. Although it would be extremely crude to defend a purely instrumentalist conception of the inter-relation between knowledge and the socio-political goals of medical practitioners of the period - that the rhetoric of science was 'used' mechanistically and systematically to achieve self-consciously defined and articulated professional

objectives - it is true, in a general sense, that 'scientific medicine' was put forward as an ideology of professional reform and uplift. Nevertheless, by treating the different contexts in which medical men appealed to the culture of science and the different goals they sought to promote as analytically separable elements of the campaign for medical reform, it has been possible to proffer a more finely-textured analysis of the historical inter-relationship between 'science' and 'professionalism' than the categories of the instrumentalist model would suggest.

In the first instance, rank-and-file general practitioners looked to science for assistance in the formidable project of dethroning and usurping the privileges of the old elite securely ensconced in the Royal Colleges and wielding monopolistic powers which issued naturally from a society long to be noted for the prolonged hegemony of its aristocracy. Aspiring professionals mounting a deferential challenge to the old ruling class had necessarily to undermine and then reconstruct the bases on which the latter had justified the monopolisation of professional benefits and the authority that appeared to be its 'natural' concomitant.(181)

This was the background to the mounting of an historic challenge to the pre-nineteenth century rationale for basing professional privilege exclusively upon classical learning. A shared educational induction

into Graeco-Roman culture certainly contributed much to the social cohesion and solidarity of the old professional elite. As one Oxford graduate of the early nineteenth century haughtily expressed it;

"<t>he advantages of a classical education <were> two-fold - it enabled <university students> to look down with contempt on those who <had> not shared its advantages, and also fit<ted them> for places of emolument, not only in this world, but in that which <was> to come."(182)

Science was useful to new professionals seeking to disperse privileges more widely in furnishing an 'objective' knowledge-frame, a vehicle for promoting rhetorical claims about medical practice in opposition to the inherited status and cultured 'gentlemanly' qualities acquired through 'good-breeding' which had long served the interests of the old professional elite. Science as a source and prop for new professional authority appeared to transcend the unfairness of partisanship, the idiosyncracies of personality, the favouritism of politics, and offered the rank-and-file a means of replacing classical erudition, hitherto an indispensable accoutrement of legitimate professional learning, with a new conception of education giving precedence to specialised knowledge, high technical standards and occupationally-specific performance. Because of the seemingly entrenched political position of the Royal Colleges, and the radicals' acute perception of the importance of undermining it, the espousal of science in this context often went in

tandem with immoderate and uncompromising anti-monopolistic rhetoric.

In the second instance, science was espoused by regular medical practitioners in connection with a central preoccupation of new professionals - the regulation of competition from outside their (self-proclaimed) ranks. Professionalisation demanded the effective containment of quackery; science supplied an objective basis for the control and ultimately the monopolisation of the market for medical services. Although we have seen that irregular practice across the whole spectrum of healing modalities was rife in England during our period, there was an important sense in which 'quackery' as such was a social construct, an artefact of the campaign of regular health professionals to promote scientific medicine as the only effective therapeutic method, and ipso facto, to confine legitimate practice to those conversant with its esoteric mysteries, excluding all pretenders from the benefits which professional practice might confer. The vicious polemic directed at homeopaths, mesmerists and other alternative categories of healer by the self-styled orthodox reveals how, as Johnson has argued,

"<c>harlatanism and quackery are ... a creation of professionalism and not the cause of it. That is to say that periods in which it is claimed that charlatanism is rife and needs to be stamped out are just those periods when an occupation is attempting to establish or struggling to maintain a monopolistic position."(183)

In the first context, the rhetoric of science as a universally applicable set of objective truths about the nature of disease was deployed against the invidious monopolies of the medical and surgical elite. In the second, the same rhetoric featured in the campaign to secure a monopoly over the medical market, thereby excluding external competitors from the exercise of professional authority and preventing the same from obtaining professional status and rewards.

In the third instance, the superiority of the 'scientific' expertise possessed by men with appropriate medical training might be presumed to have guaranteed them a favourable position from which to negotiate for state mediation - a form of occupational control that has frequently enhanced the power and prestige of professionals.(184) One scholar has argued along these lines in asserting,

"<t>he fact that medicine operates in an area of vital concern for the individual and the community compels the state to intervene. Once scientific medicine had offered sufficient guarantees of its superior effectiveness in dealing with disease, the state contributed willingly to the creation of monopoly by means of registration and licensing."(185)

However, quite apart from the sheer myth of therapeutic efficacy, we have seen that the British state during the first half of the nineteenth century proved markedly reluctant to intervene in the sphere of public health save in exceptional circumstances, and that its Laodicean stance was largely maintained despite

the functional indispensability of a healthy workforce to the new industrial capitalist order on the one hand, and the scientific claims and pretensions of medical men on the other. The saliency of the medical function did ultimately induce state sanction for monopolistic tendencies - in exchange for the provision of professional services pro bono publico - but it was a more protracted, nuanced process than authors such as Larson convey by an emphasis upon smooth assimilation.

In the next two chapters we focus on medical education at the English Universities during the first half of the nineteenth century, and demonstrate how a different ethos in these institutions of higher education might serve alternative professional interests.

CHAPTER FIVE

THE STUDY OF MEDICINE AT THE ANCIENT ENGLISH UNIVERSITIES.

"It is the glorious beauty of an English University that, before any man can obtain its degree, in any science, he must have passed through that course of general education and acquired that knowledge of literature, both ancient and modern, which constitutes the well informed gentleman; hence it is that the English clergy, as a body, are, beyond comparison, the best scholars of the age, and possess more learning, theological and general, than any other equal number of men in the world." 'A Retired General Practitioner.' (1)

"It is far from my wish to detract from the merits of our English Universities; but will anyone pretend that medical knowledge of any real utility is to be obtained there? It is as much impossible that knowledge of the practice of physic can be obtained there, as that of practical navigation." 'Medicus.' (2)

In the first half of the nineteenth century, long-established characteristics of the ancient English universities became the object of increasingly vituperative criticism. New social interests and forces unleashed by the onset and development of capitalist industrialism in Britain sought to undermine the legitimacy of, and transform, traditional institutions that were a bulwark of social groups and interests of the 'ancien regime'. The Universities of Oxford and Cambridge were among the most prominent of such institutions. (3) Virtually all aspects of university life - its administration and financing, its social exclusiveness, pedagogy and the curriculum, and its overwhelming ecclesiastical orientation - became subjected to the mounting radical assault of educational

reformers. The reform movement sprang from a number of different sources but consisted principally of diverse elements of the swelling middle-class which acquired a semblance of political coherence under the direction of radical dissenters and Benthamite Utilitarians. From the perspective of the latter, the English Universities stood condemned as inefficient and unproductive in terms of the 'national interest' and as antiquated fortresses of aristocratic privilege.

The intensification of interest-group conflict, partly a by-product of industrialisation(4), gave rise to a comprehensive debate over the very function, central purpose and rationale of higher education. The respective merits of 'liberal' as opposed to 'professional' education, of 'classical' or 'scientific' curricula, of 'general' or 'specialised' knowledge, and of the university conceived either as an institution for the transmission of inherited culture or as a place for the prosecution of original research were continuously debated by politicians, educational philosophers and academics alike.(5) On the outcome of these educational controversies the future direction and course of medical education was intimately dependent.

Three long-standing and mutually sustaining characteristics of the physiognomy of the ancient English universities which contributed to the atavistic and autochthonous quality of the medical education officially provided there, were most especially

condemned by utilitarian educational reformers.

The first was the immensely powerful influence the established church continued to exert over the day-to-day administration of university affairs and the substantive content of the university curriculum. Teaching in the colleges of Oxford and Cambridge remained first and foremost a rung on the ecclesiastical ladder rather than a full-time academic career.(6) During the late eighteenth and early nineteenth centuries, approximately one half of Cambridge's graduates and almost two-thirds of Oxford's went into Holy Orders on leaving the university.(7) In the early Victorian period both universities endured as exclusive preserves of wealthy Anglicans and conservative bulwarks of Christian orthodoxy. William Whewell, Master of Trinity College, Cambridge and author of learned treatises on educational philosophy(8), defended the ecclesiastical status quo in 1840:

"I think that this Church having been so interwoven with the spirit of the country, must be continually identified with that spirit by the prevalent system of education, and that when this ceases to be done, the Church cannot but speedily fall which would be the greatest evil the country could suffer."(9)

At Oxford University, Anglican divines (notably Newman and other High Church luminaries of Oriel College) also vigorously upheld Anglican domination of higher education and justified the central importance of theology as the queen of all the sciences on the

university curriculum. These aims were valued both as ends in themselves, and for imparting those qualities of delicate taste, erudition and moral and spritual sensibility requisite for the desired end-product of a university education - the Christian gentleman.(10)

So entrenched was the educational power of the established Church at the ancient universities that despite the repeal of the Test and Corporation Acts in 1828, the Emancipation of Catholics in 1829, and the Reform Act of 1832, the curtailment of Church of England privileges at Oxford and Cambridge awaited action following a series of Government Commissions from the 1850s onwards. Until then, divorce from the secular world was a natural consequence of hieratic assumptions about the function of a university.

Prolonged ecclesiastical hegemony over the universities also perpetuated the second educational 'evil' denounced by secular and utilitarian critics. This was the Laodicean indifference with which the governing authorities of these institutions were seen to regard the prosecution of scientific study and research. By the early Victorian period, William Whewell had coined the neologism 'scientist' to designate the occupation of those who earned their livelihoods as assiduous cultivators of the study of nature(11), but science, as 'progressive scientists' saw it, played almost no part whatever in English education at the primary, secondary or tertiary level. The reigning

concept of 'liberal' education, to which the universities subscribed, in no sense demanded science (as viewed by reformers) as a necessary educational component let alone encompassed the possibility of a degree based exclusively on scientific knowledge.(12)

Science was peripheral to the main functions of both English universities where honours examinations (whether classics at Oxford, or mathematics at Cambridge) diverted students from lectures in natural science; such non-honours courses prescribed for study demanded moral philosophy, classics and divinity, but not natural science. Virtually no scholarships or fellowships were bestowed upon students of science; nor did the colleges and, more importantly, the Universities provide much in the way of apparatus and laboratories, without which the serious prosecution of scientific experimental research was impossible. In England, many successful scientific investigators (Priestley, Dalton, Faraday, Davy and Joule) undertook their research and experiments outside the ivory towers of the ancient universities.(13)

The third educational abuse decried by early Victorian reformers committed to the transformation of science from a marginal attribute of cultured gentility to a fully differentiated occupation related to the deployment and canalisation of financial resources within the English Universities. This problem was a Pandora's box from which other grievances emanated, as

revealed during the 1830s and 1840s when the insouciance of the English universities towards scientific culture became embroiled in wider controversies surrounding the 'decline of science'.(14) Charles Babbage, Lucasian Professor of Mathematics at the University of Cambridge, bitterly lamented in 1830 the prevalent amateurism of English science which he attributed to the climate of voluntarism and self-help consequent upon governmental acceptance of the bourgeois-radical doctrine that government could do nothing for science that private enterprise might profitably do for itself. Babbage explicitly tied the issue of professionalisation to the failure of the English government to provide the resources necessary to encourage scientific activity. It was primarily because "all abstract truth {was} entirely excluded from reward" under the prevailing system of laissez-faire, that "the pursuit of science {did} not, in England, constitute a distinct profession."(15)

Later in the same year Brewster imputed the misfortunes of would-be professional scientists more explicitly to the outrageous circumstance that "there {was} not one man in all the eight universities of Great Britain ... known to be engaged in any train of original research."(16) Specialised scientific research depended on a strong professoriate and the investment of resources by the central authority of the university. Here, in sum, was the Sisyphean task confronting the reformers whose self-appointed mission was to mould the

character of the old universities into conformity with the requirements of their conception of a 'modern' and secular age. For the bulk of the wealth vested in Oxford and Cambridge resided not with the university as such, but with autonomous corporate colleges which deployed it almost entirely to the end of advancing ecclesiastical interests. Only by rechannelling wealth, and thereby challenging the clerical interests possessing it, would the secular educational policy prescriptions of the radicals be effected in the ancient English universities. It was a testament to the resilience and tenacity of clerical influence there that such prescriptions were effectively thwarted. Before mid-century scientific and medical study at the ancient universities gained academic weight only in a gradual, ad hoc manner, and not through confrontation but compromise with the church.(17)

The hegemony of the established church, the disparagement of scientific culture, and the maldistribution of resources thus constituted the three most significant, inter-related and mutually reinforcing features of the institutional and intellectual environment in which the academic study of science and medicine was conducted at both the English universities. However, changes in medical pedagogy, in the social composition of students, and in the requisite subjects on the curriculum were historically complex and not necessarily uniform in each university.

The underlying philosophy and implicit social function of medical education at the ancient universities became more ambivalent during this period. For insofar as medicine, or more accurately, 'physic', continued to receive the high social esteem and approbation conventionally accorded to the traditional 'old' professions, medical education at Oxford and Cambridge might proceed without controversy under the benign, gentlemanly cultural umbrella of 'liberal' education. Yet insofar as a viable education in medicine became increasingly identified, as the century advanced, with practical or vocational skills, with training in the utilisation of the apparatus, techniques and methods of vivisectional experimentation and the laboratory, it became more difficult to justify medical studies on the basis of this tenacious educational ideology. If university teachers desired medical study to progress on a 'scientific' basis (i.e. extrapolating from and utilising the methodologies and results derived from the basic and collateral sciences for therapeutic ends) it was necessary to make common cause with those seeking to introduce and extend the teaching of the sciences of nature in the potentially hostile environments of unreformed Oxford and Cambridge. To this extent the future of medical education in the university was interlinked with the progress of 'scientific' education more widely.(18)

The most effective strategy for rendering the study

of scientific medicine an integral component of higher education at the English universities was to insist on its compatibility not only with the reigning doctrine of a 'liberal' education, but also with ecclesiastical assumptions about the function of a university which remained dominant before mid-century. The most effective defence of 'scientific' studies at these institutions would be mounted less upon utilitarian claims about their practical usefulness than upon arguments stressing their two-fold value in providing alternative sources for abstract mental culture and for inculcating an elevated sense of God's purposive intervention in the natural world. This strategy was indeed adopted by protagonists of science at both Oxford and Cambridge, but contingent local circumstances and different long-term historical trajectories of intellectual and cultural development demand an independent examination of each university's medical education.

Oxford

The short-term late eighteenth century revival of medical education in Oxford had been accompanied by the foundation of new benefactions. In 1765, a new anatomy school was created at Christ Church College in connection with which Mathew Lee bequeathed, under stringent conditions, one hundred pounds annually for the maintenance of a permanent Readership in Anatomy. In 1780, Earl Litchfield endowed a Chair intended for the reading of clinical lectures on Physic to students

attending a hospital or infirmary. Dr. George Aldrich also left a benefaction in 1797 to establish three independent medically-based praelectorships or professorships - in the Institutes of Medicine; Medical and Philosophical Chemistry; and the Practice of Physic.(19) These formal philanthropic endowments were less the product of magnanimous benevolence than a reflection of the University's defective institutional provision; and a manifestation of Oxford's post-Restoration crypto-Jacobitism - for the endowments were in part intended to bring political credit to the Tories.(20)

In the absence of a favourable social and cultural milieu, the formal existence of these privately-endowed posts, as with long-established chairs like the Regius Professorship of Medicine, did not necessarily mean educational activity in the field of science and medicine was regularly taking place. During the earlier decades of the nineteenth century, there was some substance in the self-interested allegations of radical reformers concerning the educational accidie at the University of Oxford. The 'Westminster Gazette' charged in 1831 that "<t>he University of Oxford <had> long ceased to exist except for electoral purposes."(21) In the same year, the 'Edinburgh Review' expressed outrage at the fact that of the twenty-three Professors employed by the University of Oxford, only nine were delivering any lectures at all.(22)

Table 5'A' indicates how few members of Oxford's professoriate were engaged in teaching medically-relevant subjects; and Table 5'B' indicates how few students were graduating in medicine between 1822 and 1834. At a time when over one hundred medical students were regularly graduating at the University of Edinburgh each year, scarcely more than two did so annually at the University of Oxford.(23)

A vivid picture of the serious decline into virtual non-existence of medical education at Oxford was conveyed by the evidence of John Kidd, Regius Professor of Medicine, to the Select Committee on Medical Education in 1834. Kidd explained to the Committee that the means for teaching the subject of medicine at Oxford were "of the slightest".(24) Formally, the Regius Professor was obliged to deliver two courses of lectures in anatomy comprising in toto about twenty lectures annually, and also to recommend degrees. Kidd also referred to the formal existence of the Aldrichian Professorship in the Theory and Practice of Physic whose incumbent in 1834 was Dr.Ogle; but Kidd admitted that for a period of more than thirty years there had been such a paucity of interested students that the lectures had rarely taken place. As for dissection, which outside the ancient universities was increasingly regarded as indispensable to medical training, Kidd emphasised that Christ Church College alone possessed requisite facilities (arranged privately for some students since

1786), but even there, "for the last six years it <had> been utterly impossible to get a subject."(25)

Concerning the conduct of examinations and the awarding of medical degrees, Kidd became more circumspect in the evidence he gave. Strictly speaking, Oxford's medical examination comprised the theory and practice of medicine, anatomy, physiology, pathology, materia medica, medical chemistry and botany, together with discussion of two of the four greatly revered ancient medical authors - Hippocrates, Aretaeus, Galen and Celsus.(26) Although required to question candidates himself, Kidd declared that in normal circumstances it was rare for him to do so. As regards candidates undergoing disputationes and lectiones on medical subjects, Kidd considered such exercises had degenerated to "mere form"(27) throughout the previous half-century. In full cognisance of all the criticisms levelled against Oxford medical education by licenciate physicians and members of the lower branches of medicine, Kidd defensively conceded that he was "quite aware ... that when customs <had> become obsolete ... they <might> become the subject of ridicule," but nevertheless, he continued,

"if it was known that the individual member <had> studied medicine effectually in London, or Edinburgh, or elsewhere, there <was> no necessity in the university to require attendance on all those forms and lectures in Oxford, which <had become> of no value when its students <had> resorted to better schools of medicine."(28)

Kidd's admission that Oxford University was inferior as a centre of medical education to competitors elsewhere was only slightly attenuated by his paean of praise for the library and bookshop facilities available in the town - the almost singular positive response elicited from Kidd by the SCME of 1834.(29) It was apparent from Kidd's evidence that Oxford University had effectively abandoned its responsibility for teaching medicine to its candidates for medical degrees.

Both a symptom and cause of Oxford's difficulties widely acknowledged during the 1830s was the inadequate remuneration secured by dons teaching scientific and medical subjects. Kidd informed the SCME that he was not well rewarded, receiving more as Master of Ewe Elm Hospital (70) than the miserly 36 that he earned in his capacity as Regius Professor. Kidd attempted to circumvent the problem of parsimonious emolument by holding concurrently with these positions the Tomlins Praelectorship and the Aldrichian Professorship of Anatomy. This swelled his total annual income to the not inconsiderable sum of 477-18s-10d which, however, he still considered inadequate.(30) Table 5'A' reveals that Professors Ogle, Daubeney and Buckland, as well as Kidd, augmented their salaries by assuming formal responsibility for more than one curricular discipline.

Undoubtedly the critical factor in the waning vitality of Oxford's scientific and medical education was the obdurate indisposition of the University and

ultimately the government to invest financial resources in its support. In the absence of any such investment and of any authority except the 'hidden hand' working to promote some longer-term rational framework within which the future direction of educational change might be planned, new initiatives were inevitably left to the vagaries of voluntarism and individual initiative. When John Kidd succeeded Sir Christopher Pegge as Lee's Reader in Anatomy in 1816, he was obliged, given the deficiency of central funding, to purchase microscopes, Florentine wax models of the human body for dissection, and chemical apparatus, at his own expense.(31) Similarly, Charles Daubeney, retiring from medical practice in 1829 to pursue his scientific interests in geology, botany and the chemistry of soils, only managed to have a lecture room and laboratory constructed in Oxford's Botanical Gardens more than a decade later by meeting all expenses himself.(32)

Even when the University's aspiring scientists were able to wring concessions from a suspicious Convocation, they continued to find it difficult to secure sufficient resources to provide adequate laboratory space and facilities. Before 1850, only the Ashmolean Museum (then adjacent to the Sheldonian Theatre), the Clarendon Building and the Radcliffe Observatory (conceived not for teaching but for research) complemented the Christ Church Anatomy School and Daubeney's Laboratory as possible sites for Oxford's undergraduates to study

seriously the sciences of nature. In 1846, only Daubeny, Walker, Buckland and Acland held any responsibility for teaching under the rubric of the University's 'scientific' education.(33) Even Oxford's Regius Professor of Medicine, it should be emphasised, possessed no official locus standi at the Radcliffe Infirmary, and stands out as an obvious victim of the city's under-resourced institutional provision for science and medicine.(34)

By the 1830s and 1840s, it had thus become apparent that Oxford University's late eighteenth century medical renaissance had not been sustained. One cause frequently invoked by historians to explain this relative decline may be dismissed from the outset. This relates to individual teachers and, in particular, to the deterioration of the personality and capacity to lecture of Professor Kidd.(35) Quite apart from theoretical and historiographical objections to centring history on the psychological investigation of personality and questionable assumptions about particular individuals' 'internal states', the dire reputation of Kidd has been constructed on the basis of documents published by a foreign visitor who spent merely a single day scrutinising Oxford's medical education. A more satisfactory explanation for the decline emerges from recognising the consequences for would-be medical students of Oxford's examination regulations. Neophytes were not only obliged to graduate in arts subjects

before commencing their medical studies, but were also compelled (before the reform of 1833-1834) to secure a master's degree in arts in addition to the bachelor's before proceeding with the course leading to MB.

Earlier, in 1807, the BA degree had become a written examination and the arts degree had been divided into two separate schools - one in Literae Humaniores or 'greats', and the other in mathematics and physics.(36)

The course in physics was effectively the only scientific subject set in any Oxford examination other than the medical. Study in both these schools led to the conferral of honours degrees, but most tutors remained either indifferent to the appeal of science, or actively discouraged students from scientific activity. The already formidable encumbrances to the achievement of systematic medical education at Oxford were exacerbated by the continuance of religious tests and the emergence of alternative institutions (notably the new University of London) where quality medical education could be purchased.(37)

Leaders of the movement to secure a significant place for the study of science and medicine at Oxford, had few illusions about the enormity of the task confronting them. Sir Henry Acland, undoubtedly a powerful figure first in Oxford and later in British medical circles(38), recalled in his famous published letter to James Andrew that his endeavour to implant and nurture biological studies in the University seemed at the time

"beyond <his> power of body or of mind."(39) For during the 1830s and early 1840s, as Acland recollected,

"<t>he University had not a single laboratory for students in any subject. The Regius Professor of Medicine had neither books, drawings, apparatus, nor apartment, and was not necessarily attached to the hospital."(40)

Acland here drew attention to some of the critical factors underlying Oxford's scientific malaise with a view to vigorous remedial activity, but some of his colleagues resigned themselves to an attitude of pessimistic fatalism. William Buckland, Oxford's renowned geologist whose own career was not without controversy, responded to Acland's request to sign a petition in support of the extension of scientific studies in the university, with the retort:

"<s>ome years ago I was sanguine, as you are now, as to the possibility of Natural History making some progress in Oxford, but I have long come to the conclusion that it is utterly hopeless."(41)

Acland and fellow proselytisers nevertheless continued to campaign for reform undaunted. Their energies were expended principally in striving to accomplish two objectives - the creation of an Honours School of Natural Science; and the construction of a purpose-built Hunterian Museum to serve as a nucleus for the prosecution of scientific educational activity at Oxford.

A statute to accomplish the first objective was rejected in 1839 by a large majority in Convocation, but

the matter was reopened in 1846, and the occasion of the BAAS meeting at Oxford the following year gave additional impetus to the movement for scientific reform. At Daubeney's suggestion, Acland compiled a document recommending a considerable extension of the range of scientific studies conducted at the university. Acland contended:

"<w>hether it be or not be our duty to provide against our graduates leaving the University in utter ignorance of the first principles of those great laws which are imposed on the material world, it is a duty to make some reasonable use, in respect of education, of the foundations we have accepted and now possess for the furtherance of knowledge in Anatomy, Botany, Chemistry, Natural Philosophy, Geology etc."(42)

If Acland was to realise what clearly amounted (in the context of the hallowed cloisters of mid-nineteenth century Oxford) to highly controversial proposals, it was critical to distance them as unambiguously as possible from any taint of mere vocationalism and trade. In fact, Acland went further, endorsing unreservedly the proposition, more famously associated with J.S.Mill, that the university was no proper place even for 'professional' education.

Acland's aristocratic background and attitude of severe moral rectitude endowed him with an uncompromising commitment to the ennobling function of university education. In his conception, a university which only equipped students for a particular mode of

gaining a livelihood was a travesty, and no true 'universitas' in its literal sense. The idea that Oxford University should produce merely skilled lawyers, dexterous surgeons, trained physicians or engineers was, to Acland, completely anathema. The production of cultivated, noble and civilised human beings was the only proper function of a university. Herein resided the superiority of Oxford as a centre of scientific education over the medical corporations; Acland claimed the university could "turn out as her graduates a set of men of far more culture, both general and scientific, than <was> required by <the> Colleges of Physicians and Surgeons." (43) It was strictly within the parameters of 'liberal' education that Acland justified in 1848 his two-fold project of introducing elements of certain branches of natural knowledge as a component of Oxford's B.A. degree, and of re-evaluating the University's educational and licensing activities.

On the premise that general insight into scientific laws was 'ennobling' rather than 'useful', the University allowed a new examination Statute on natural science to come into existence in 1850. (44) Acland's original intention was to compel all Oxford's undergraduates to attend lectures and be examined in scientific subjects, but it was eventually decided that Natural Science would not be imposed but permitted as an addendum to the conventional honours degree. The reform had prompted much acrimonious opposition and a stormy

passage in Convocation, yet anticipated consequences were slow to materialise. Not until May 1853 was the first examination held, and the number of students availing themselves of the opportunity to undertake the new examinations was erratic. There were only two successful candidates between 1853 and 1855; by 1869, when the facilities of the Museum were at the disposal of interested students, this number had swelled to only fifteen. In the 1840s and 1850s it was still not possible to canvass for the cause of medical science in Oxford via a strategy of irenic diplomacy or sophrosyne.(45)

Opposition to the thrust of 'modernisation' (with which the extension of scientific and medical education was associated) was manifest in 1850 when the first Royal Commission to inquire into 'the State, Discipline, Studies and Revenue of the University and Colleges of Oxford and Cambridge' was appointed. In marked contrast to the Commission's temperate reception at Cambridge, it aroused deep suspicion and vehement condemnation at Oxford - primarily, as Engel has argued, because the prospect of parliamentary intervention

"awakened nightmares of the seventeenth century when both the Puritan Commonwealth and James II had attempted to crush the autonomy of the university."(46)

The major recommendations of the Commissioners' Report of 1852 were seen by Oxford's conservative tutors as a manifesto for unwelcome radical change. They

responded by refusing to recognise the legitimacy of the Commission.(47) From the clerical dons' standpoint, the reform proposals amounted to a direct threat to collegiate interests around which an accepted and relatively stable system of power relations had developed within the University.

For the Report was pervaded throughout by the assumption that the administration of university affairs required radical restructuring to provide for a centrally-financed professoriate able to promote the highest possible academic standards. Recommendations to replace collegiate tutorials with university-organised lectures amounted to an extension of secular academic authority, thus perforce undermining clerical hegemony over university life.(48) Few Oxford clerics failed to grasp the prodigious implications of reforms calculated to shift the locus of power away from collegiate towards central university auspices. As one tutorial group responded to the Commission's proposals, "<t>he effect and indeed the avowed object of this recommendation <was> largely to remove education from the hands of the clergy."(49)

In the event a change of government (from Lord Russell's campaigning Whig ministry to Lord Aberdeen's weak and compromising coalition) effectively thwarted the most pivotal elements of the Commissioners' recommendations, and saved Oxford's clerical tutors from having to confront their immediate consequences.(50)

Individual colleges retained their jealously-guarded autonomy; their statutes were theoretically remodelled under the executive scrutiny of the government; but few of Oxford's reformers were satisfied with the outcome of the first Royal Commission. In the early 1870s, Benjamin Brodie reflected on the tangible benefits secured in the aftermath of the Commission:

"<a> few professorships of ancient date founded by men of very different stamp, which the colleges had suppressed, were revived, but no real or adequate provision was made even for the maintenance of lecturers or professors necessary to carry out the education of the place, and out of these vast funds, not a sixpence was devoted to the advancement of knowledge or the promotion of scientific or literary research, or to the support of museums or laboratories."(51)

Not the establishment of the Royal Commission per se, but the movement - originating independently and earlier(52) - to finance, construct and support a new University Museum of Natural History was the strategic fulcrum of the campaign to open Oxford's historically-closed, recalcitrant doors to the study of the modern biological sciences. The campaign to build a Museum as the main focus of scientific teaching and research, and depository for various comparative anatomical collections, came to symbolise all which men like Acland - whose goal was "to make the study of Nature an integral part of the general education of the University in a complete and efficient manner"(53) - were striving to achieve in mid-Victorian Oxford. It is therefore

of singular importance to examine the origins, leadership, strategies and eventual success of this campaign. Its history reveals not only the immense complexity of the process of educational change, but also the impossibility - or, at least, explanatory aporia - of separating out aspects of a historically specific 'external' environment (such as the collegiate appropriation of financial resources) from a particular 'internal' milieu (such as an intellectual complex of religio-philosophical or metaphysical representations of nature). Historians have debated whether the successful outcome of the campaign (registered by the historic decision of Convocation late in 1854 to support the Museum by a margin of 68 to 64 votes) was an episode in the history of the ever-problematic relationship between science and religion, or a classical conflict over the apportionment and distribution of scarce resources.(54) Thus the ramified inter-relationship between these critical factors has been obscured.

In the late 1840s Henry Acland, only temporarily discouraged by Buckland's refusal to endorse the petition in support of the extension of scientific studies, embarked on a campaign to appeal to a wider public. As he recalled, giving evidence to the Royal Commission on Scientific Instruction of 1872, the project demanded

"the usual kind of laborious agitation that men who are bent upon an object in this country, with which object their fellow

creatures do not sympathise have to go through; the writings of hundreds and thousands of letters, the obtaining the services of persons more or less interested in the matter, the getting together supporters of all kinds."(55)

Commencing in May 1849 with the passing of a resolution in Convocation to consider the location and cost of constructing a building for the teaching and learning of Natural Science (which became known simply as 'the Museum'), it took a further five years, in the face of concerted opposition and vitriolic pamphlet warfare(56), before the delegacy finalised plans on the basis of which Convocation could settle the issue. The scientists' project aroused the same conservative ire encountered by the Royal Commissioners; but opposition was diverse, comprising three main elements.

The first was a loosely-defined group of older, reactionary dons who responded to proposed innovation and change with the customary bewilderment, suspicion and simple-mindedness of the conservative. The second, spearheaded by Oxford's classical economists and some classical humanists, such as Benjamin Jowett, were convinced of the original sin of scientific culture and were opposed, in principle, to Acland's Pelagian campaign. This group seized on the issue of the expenditure of financial resources in order to frustrate reform. The third interest-group comprised zealous upholders of the Anglican Church who deprecated the potentially nullifidian, euhemeristic or pagan

consequences of embracing science.(57)

It was critical to the result of the momentous decision within Convocation that Oxford's eminent Anglicans (including Pusey, Newman and Keble) did not share the pristine, elemental dread of the profane temper of science often expressed in the religious proclamations of other divines. Understanding the importance of these Anglican intellectuals' beliefs about science demands exegesis of the religious context of the Museum controversy, and the emergence in the early Victorian period of the Tractarian or 'Oxford' movement.

As observed earlier, it was customary for cultivators of the 'biological sciences' - as studies of the natural world became known only at the beginning of the nineteenth century(58) - to defer, when publishing the results of their scientific labours, to the orthodox doctrinal claims of natural theology.(59) Oxford University's history, moreover, is largely synonymous with the history of the established Church. Examining the work of Henry Acland's predecessors as Lee's Reader of Anatomy or Regius Professor of Medicine confirms the critical importance of the religious context for understanding Oxford's medical education. John Kidd, who held both of these positions, published in 1824 "An Introductory Lecture to a Course of Comparative Anatomy Illustrative of Paley's Natural Theology"; he also wrote "Adaptations of External Nature to the Physical

Condition of Man", a contribution to the Bridgewater Treatises which offered perhaps the most convenient summary of the whole discipline of Natural Theology.(60) Acland's own earlier thought is readily intelligible as a contribution to a broadly Theistic cosmology whose leading exponents were, in the early nineteenth century, Herschel, Humboldt, Sedgwick and Whewell.(61)

Given the resilience of clerical traditionalism and the 'ernst' with which spiritual matters were carried on at Oxford, it is scarcely remarkable that the University's revival in the 1830s from its apparently dogmatic slumbers was quintessentially theological. Its most significant expression was the 'Oxford movement' whose 'raison d'etre' lay in the defensive redefinition of the ideology legitimating Anglican domination.(62) Its major tenets must be grasped if we are to understand the full significance of Acland's successful campaign to realise Oxford's scientists' demands for the Museum.

Tractarianism (as the Oxford Movement became known on account of the publication between 1833 and 1841 of 'Tracts for the Times' embodying the school's doctrine) began as a protest against political events and tendencies observable in the reformed Parliament after 1832, seen by Anglican divines as threatening the total subservience of the Church to temporal authority. The Tractarians were fiercely assertive of the rights of the Anglican Church and its historical apostolic roots, and remained anti-Erastian throughout the movement's

chequered history. The role of the established Church in providing an authoritative interpretation of revealed truth was the Tractarians' cardinal theme. Through its organ, 'British Critic', Newman and his spiritual sympathisers held up a purely monastic ideal against the encroachments of a despised utilitarianism. The movement represented at once an affirmation of the Renaissance and a condemnation of the Reformation. Ritualism and the symbolic import of the 'High Church' were the most important legacies bequeathed to posterity by the Tractarians after Newman's defection to Rome in 1845.(63)

Henry Acland was not alone in being profoundly influenced by Oxford's religious revival, which incorporated Broad Church Evangelicism in addition to Tractarianism. Newman's sympathisers were sufficiently numerous and cohesive in Convocation to hold sway over most contentious policy issues.(64) Moreover, and most critically, the tenor of Newman's published views on the relationship between science and religion perhaps supplied a gnostic scientist like Acland with a framework for prosecuting scientific activity without flaming an odium theologicum or inviting the opprobrium of self-styled upholders of religious orthodoxy. For in Newman's classic text, "Idea of a University", is outlined a conception of science and theology as inherently autonomous spheres which entailed entirely separate methodologies. "Niebuhr", as

Newman tersely expressed it, "may revolutionise history, Lavoisier chemistry, Newton astronomy; but God himself is the author as well as the subject of theology." (65) Thus science and theology did not 'correspond' but inhabited, as in more orthodox theological concepts, hermetically sealed alternative domains; each might 'progress' in its own separate way, in mutually satisfying isolation.

These were the terms in which Henry Acland justified his scientific endeavours to Pusey when seeking to canvass Tractarian support for the Museum. Had the old guard of the Oxford Movement abstained, or adopted a neutral political role in the crucial division, Acland's biographer stresses that the motion to support the Museum would have failed. (66) His further contention that Acland's personal influence accounts almost entirely for the campaign's success unfortunately reveals more about the naively hagiographical assumptions of most biographical histories than the complex social dynamics of the movement. (67) Nevertheless, the compatibility between Acland's clear statement to Pusey of the rationale for supporting the Museum proposals and the rekindled spiritual enthusiasms of the Tractarians does appear to have proved critical in tilting the balance of forces in the scientists' favour. (68) Acland's unswerving religious convictions and his staunch evangelical commitment undoubtedly made him an effective canvasser for Tractarian support.

Just how a religious 'Weltanschauung' might be invoked to advance scientific education was spelled out in a pamphlet of 1859 which Acland co-authored with his close friend and associate John Ruskin. The express purpose of publishing this document was to redress the almost scholastic "intellectual one-sidedness"(69) long manifest in Oxford University's higher education. The authors observed that it had taken

"some centuries from the epoch of Roger Bacon, followed here by Boyle, Harvey, Linacre and Sydenham, besides nearly two hundred years of unbroken publication of the Royal Society's Transactions to persuade this great English University to engraft, as a substantial part of the education of her youth, any knowledge of the great material design of which the Supreme Master-Worker has made us a constituent part."(70)

The facilities of the Oxford Museum offered a practical means of achieving that redress via illustration of the mysteries of Nature. It supplied the student with equipment and a work-room to undertake heuristic research; a lecture-room with an adjunct for private study; general space for the display of illustrative specimens of the physiological or comparative anatomical series; and a library where the student could familiarise himself with the tenets of book medicine, ancient and modern.(71) The Museum was modelled on a grand Hunterian scale; Acland drew attention to the scope it provided for wide, multidisciplinary involvement - astronomers, geologists, geometricians, physicists, natural philosophers,

chemists, minerologists, anatomists, physiologists and zoologists - might all profit from its existence. Acland particularly underlined the value of the Museum for medical students. With a characteristic theological gloss, he emphasised how, with "the aid of physiological illustrations", the medical student might begin to understand "how hard to unravel <were> the complex mechanisms and prescient intentions of the Maker of All." (72) Oxford's Museum stood as a testament to Acland's evangelical commitment, and to his conception of Nature as a phenomenon whose ultimate origin and meaning was knowable only to a beneficent creator.

The all-important victory took place on 11th December 1854; but the Museum's foundation-stone was not laid until the summer of 1855; not until the next decade could medical students take full advantage of its scientific facilities. (73) If the realisation of the aims and objectives of Oxford's scientific community vested in the fight for the Museum is a notable episode in the history of ongoing encounters between scientists and ecclesiastics, it clearly runs contrary to the image of an elemental struggle of Promethean science against the chains and shackles of religion conjured up by the notorious encounter between Huxley and Wilberforce. (74)

Yet the campaign for the Oxford Museum was also a struggle over the deployment of resources. Acland's ambitions for the Museum would have remained frustrated had he relied exclusively on voluntary sources of

finance. Only after the University had been credited with £60,000 in the form of profit from the Clarendon Press, and strong encouragement from the Royal Commission was the final critical £30,000 wrung from a divided Convocation.(75) It was also surely symptomatic of Oxford University's root structural problem - collegiate strength and autonomy impeding the the emergence of a centrally-financed professoriate - that Acland did not apparently even contemplate demanding concessions from her opulent colleges.

Apart from the Museum, however, the University of Oxford scarcely provided the aspiring medical student with a congenial environment for receiving serious instruction in scientific medicine. When, in 1857, Henry Acland assumed both the Regius and Litchfield Professorships he had no official residence, laboratory or assistants at his disposal, and earned a meagre 100 per annum from his Chairs. He failed to carry out the statutory duties of his posts.(76) Most revealing of the importance accorded to the medical sciences in Oxford was the fact that Commissioners responsible for the Statutes creating new faculties simply merged medicine with 'Natural Science'. Not until 1883 was a Faculty of Medicine formally re-established in Oxford.

Cambridge

The first half of the nineteenth century also witnessed some extension of the institutionally organised provision for the study of the biological

sciences at the University of Cambridge. The development of this field of study at Cambridge both resembled and diverged in certain respects from that of Oxford. By maintaining our heuristic focus on leading themes in the history of the English universities - the centrality of 'liberal' education, the longevity of clerical traditionalism and ecclesiastical power, the distribution of resources, and the dialectical interaction between institutional and intellectual change - we will clarify the similarities and differences in the medical education they provided.

Prominent Cambridge dons, no less than their counterparts at Oxford, took pains to extol the virtues of 'liberal' education. Prolonged debate over its merits - as much a class as an educational debate(77) - was an integral feature of the socio-cultural environment in which the medical profession was forged. At Cambridge, like Oxford too, the rationale for liberal education stressed its explicit inutility; qualities of mental and moral discipline were valued as ends in themselves over and above any mere preparation for a trade or profession.(78) Although 'liberal' educational philosophy and the desire to produce 'Christian gentlemen' was common to both universities, the subject-matter at the core of the curriculum was not - a difference with important ramifications for medical education.

Cambridge's counterpart to Oxford's classics or

Literae Humaniores as a curricular matrix for liberal education was mathematics - a discipline endowed with such a mystique that it became an object of almost sacramental veneration. In the first instance, the religious awe surrounding the discipline and its pride of place on the curriculum owed much to Sir Isaac Newton's historic connection with Cambridge and the tenacity of his influence there over a subject which he 'revolutionised' in the fullest paradigmatic sense of the word. In our later period, William Whewell's unswerving commitment to the study of mathematics and his insistence on its value for disciplining the mental faculties ensured that the subject remained central to liberal education, comprising the basic subject-matter of all undergraduates' studies.(79)

In the early nineteenth century, the very definition of the mathematical sciences was not settled, but sharply contested. Debates over mathematical philosophy cannot be characterised accurately in terms of a simple paradigm-shift from Newtonian dot notation and synthetic methods to continental differential notation and analytic methods, but the terms 'synthetic' and 'analytic' remain viable as ideal-typical constructs which convey something of the cardinal mathematical controversies of the period.(80)

As the most advanced and innovative mathematical studies (typified by Laplace's 'Mecanique Celeste' and the analytical work of Lacroix and Lagrange) were being

prosecuted on the continent, increasing concern was voiced about the relative 'sterility' and 'inferiority' of English mathematics.(81) Cambridge University, home of Newton's science, was inevitably caught up in these contemporary mathematical dissensions. Controversy over the viability of analytic mathematics at Cambridge was consequential enough to have repercussions on the teaching of physic.

The contending factions each put forward rival conceptual foundations for the mathematical sciences which could be deployed as a resource to secure different social objectives or goals. Protagonists of continental 'analytical' mathematics - notably members of the short-lived Analytical Society (1812-1813) including John Herschel (1792-1871), George Peacock (1791-1858) and Charles Babbage (1791-1871) (82) - sought to promote the new French science as a means of reforming the curriculum, stimulating research, and ultimately transforming mathematics into a veritable scientific profession. Largely on account of its strong emphasis on discovery, analytic mathematics was regarded as a suitable vehicle for accomplishing greater professionalism. Exponents and apologists for continental methods, even including the youthful William Whewell, saw themselves as reformers seeking to break with tradition and undermine accepted conventions in mathematical teaching.(83)

Advocates of synthetic methods, by contrast, sought

to perpetuate the traditional mathematical teaching established by Newton against the 'mischievous tendency' of analytics. Their defence mainly rested on the congruity between synthetic mathematics and the proven virtues of traditional liberal education; the value of pedagogical transmission of the intellectual heritage; and the importance of cultivating students' mental faculties. Here was the critical problem confronting advocates of continental mathematics; Enros has argued that "<a>nalytics, as had been the promotion of research, was to be rejected by the circumstances of Cambridge and frustrated by the ideal of a liberal education."(84)

In the event, it proved impossible to forestall the acceptance of analytic methods in Cambridge into the early Victorian period, but two important points about Cambridge mathematics with some bearing on the University's medical education stand out. First, the simple fact that mathematics as such (irrespective of how it was conceived) was central to liberal education gave Cambridge medical students a scholarly environment less hostile to the culture of science than at Oxford. Second, University and Senate House examinations (largely devoted to mathematics) supplied more appropriate qualifications for the study of physic. In the last analysis, Cambridge offered the aspiring medical student the more fertile soil in which to cultivate scientific interests in the early Victorian

period.

Cannon has contended that a group of moderate conservative, yet reforming dons (including John Herschel, Charles Babbage, George Peacock, George Biddell Airy and William Whewell) formed the node of 'the Cambridge network', which supplied a modern intellectual matrix in the pre-Darwinism period. The network's commitment to the concept of intellectual totality both prevented the fragmentation of knowledge into distinct, specialised subjects and presented a working synthesis between science and religion until it was rudely shattered by "The Origin of Species" in 1859.(85) Fear of far-reaching educational reform capable of effecting a permanent separation of science and religion impelled the network's efforts to forestall secularisation through the espousal of cautious, moderate, perhaps 'Peelite', reform.

Its members certainly included vigorous upholders of the Christian cosmogeny and zealous exponents of the teleological tenets of natural theology. By the early Victorian period, leading luminaries like Adam Sedgwick and William Whewell had disavowed the utilitarian dimensions of William Paley's philosophy, but they remained committed to this archangel of natural theology's cardinal axioms on the relationship between God, man and the natural world. Sedgwick affirmed an unequivocally positive relationship between science and religion. "The religion of nature and the religion of

the Bible" were, in his opinion, "in beautiful accordance." (86) Herschel and Babbage also composed scholarly treatises which extolled science as a source of religious inspiration; and Whewell himself published "Indications of the Creator" (1845) and "Of the Plurality of Worlds" (1854) in addition to his contributions to the Bridgewater Treatises. (87)

Cambridge undergraduates were taught that God had not only designed the universe but consciously and actively supervised and sustained its operation; that the study of Nature was, therefore, ineluctably the study of God's work which entailed participation in a divine scheme and terminated with proof of the existence of the omniscient and omnipotent designer. Broad Church theological doctrines furnished a politically acceptable and intellectually respectable umbrella under which scientific activity could be prosecuted at the University of Cambridge. (88) In the highly charged, politically sensitive climate during the aftermath of the French Revolution, Cambridge dons' receptivity to a somewhat Burkean belief in the unity of all knowledge and a view of the world as Design conduced to the provision of a form of education useful for the political and moral as well as intellectual guidance of undergraduates. Religious and political overtones are discernible in scientific education at both English Universities, but there were some local differences.

Cambridge had its Apostle's Club (a nursery for

latitudinarian sentiment) and its Campden Society in the 1840s, but these were scarcely comparable in scale, scope or influence to the Oxford movement. Most Cambridge dons, though committed to the Anglican Church, were less given to the excesses and spiritual enthusiasms of Oxford's Tractarians.(89) Cambridge's governing authorities were also less obsessed with preserving the status quo through strict adherence to the values of the established social and political order.(90) It is reasonable to posit some prima facie connection between the more restrained tone of political and religious discourse at Cambridge and its greater receptivity to scientific ideas, values and culture.

The nineteenth century opened auspiciously enough for medical education at Cambridge with the foundation in 1800 of Downing College. Sir George Downing had a personal interest in medical matters: the charter of 1800 made provision for a Professor of Medicine and fourteen lay fellowships for prospective members of the medical or legal professions in an attempt to arrest the medical faculty's perceived eighteenth century decline.(91)

As argued earlier, the language of torpor, desuetude and apoplexy is more often a reflection of deeply-ingrained positivist and iatrocetric historiographical presuppositions than an accurate register of the condition of medical education at the universities. One obvious manifestation of this

historiographical trachoma is the proclivity of medical historians to berate, with the advantage of hindsight, the 'failings' and 'shortcomings' of individual medical teachers with whom the general accidie of the 'Zeitgeist' is associated. The conventional history of medical education at Cambridge in the pre-Victorian era exemplifies this nugatory historiographical orthodoxy.

Thus Cambridge's modern medical renaissance has customarily been attributed to the beneficial and salutary influence of John Haviland, who was appointed Regius Professor of Medicine in 1817.(92) His predecessor, Sir Busick Harwood (1745-1814), however, has been summarily dismissed as a baneful and unproductive influence on medical science and pedagogy alike. Winstanley's study of unreformed Cambridge offers the bleakest and most catastrophic portrait of the state of the bio-medical sciences in late eighteenth century Cambridge: Harwood and his predecessor Charles Collignon are held responsible for the dire predicament of the University's medical studies.(93) Robb-Smith has also delivered an ex cathedra judgement that Harwood's appointment to the Downing Professorship of Anatomy in September 1800 was "an unfortunate choice"(94), but we are scarcely provided with any evidence to substantiate so sweeping a verdict. Indeed, evidence suggests that Harwood was both an effective teacher and conscientious medical scientist who merits some form of rehabilitation.(95)

Harwood was delivering courses of lectures on anatomy, physiology and comparative anatomy during the very period of the University's supposed nadir.(96) His lectures, eventually published as "System of Comparative Anatomy and Physiology"(97) demonstrated a secure grasp of human topographical anatomy, and of contemporary physiological and pathological theory. Charles Collignon (another much maligned victim of medical historians' Whiggish predilections) had published in 1765 a "Compendium Anatomica-Medicum" which Harwood found defective. He reworked this material for the benefit of neophytes and published it in revised form in 1799 as "A Synopsis of a Course of Lectures on Anatomy and Physiology".(98) Attendance at Harwood's lectures also acquainted students with the medical, surgical or pathological doctrines of Ruysch, Leeuwenhoek, Malpighi, Marriotte, John Hunter and Jenner among others, on various subjects including respiration, digestion, vesical calculus and even blood transfusion.(99)

Harwood's teaching was not confined to austere exegesis of the medical wisdom of the ancients, for he had studied surgery in London, and his textbook references to the surgical practices of the Hunters and Hewson betrayed the influence of the Windmill St.School of Anatomy.(100) Given that the 'empirical' input of the surgical perspective has been seen as unambiguously 'progressive', the traditional 'scholastic' interpretation of medical education at Cambridge again

appears defective.(101)

If Sir Busick Harwood's contribution to medical education and scholarship at Cambridge has been needlessly deprecated, it follows that the customary emphasis on the sharp discontinuity between the former and his successor, John Haviland (1785-1846) has been exaggerated.(102) Haviland's tenure of the Regius Professorship from 1817 did, however, witness reforms which extended the University's provision for education in the bio-medical sciences. The Senate passed various graces which facilitated Haviland's efforts to revive the medical school.

In 1821, a change in the regulations concerning medical degrees undermined one of the major differences between Oxford and Cambridge. At Oxford, an arts degree was a necessary qualification for medical study; but at Cambridge candidates for medical degrees were excluded if they had previously read arts rather than mathematics. Haviland's reforming grace of 1821 enabled the arts graduate to proceed to the degree of MB. In 1829, the Senate made certain courses of lectures obligatory for candidates reading for a medical degree (whereas compulsion was not countenanced in Oxford at this time). Cambridge medical students were obliged, from the early 1830s, to produce certificates of attendance on hospital wards if absent from their studies; and regulations about the MB examinations were tightened up.(103)

In 1827, a syndicate was established to implement reforms which amounted to an extension of formal rationality in examination procedures. Subsequently, exams were to be termly and written in English on the subjects of Pathology, the Practice of Physic, Clinical Medicine, Anatomy and Physiology, Chemistry and Pharmacy, and Medical Botany.(104) Some idea of the scope of the examination of 1826 was conveyed by the evidence of Dr. Burrows to the SCME of 1834;

"the examination was conducted by the Regius Professor of Physic, Dr. Haviland; it consisted of passages selected from Aretaeus, the aphorisms of Hippocrates, and the writings of Celsus, which were required to be translated into English; and likewise of a paper of questions on anatomy, physiology, pathology, and the preparations of the Pharmacopeia of the London College of Physicians."(105)

Contemporaneously with these reforms, the Senate decreed that the Downing Professor of Medicine must deliver, as part of the formal responsibility of the position, a course of fifty lectures on an original subject not covered by other lectures. In the first two courses of this new series, medical students were instructed on 'the preservation of health' and 'materia medica and therapeutics' by Dr. Fisher and Dr. Latham respectively.(106)

The passage of these graces scarcely amounted to a revolutionary climacteric in the history of medical education at Cambridge, but such institutional developments fostered a more receptive climate for

medical science than existed in unreformed Oxford in the 1830s. The individual 'influence' of Professor Haviland cannot be separated out (without historiographical apoplexy) from wider elements of the social and institutional context in which he operated.

Given this proviso, the importance of Haviland's tenure of the Regius Professorship of Medicine was as follows. Haviland's own medical education had not been confined exclusively to scholarly engagement with those immortal truths of medical scientia enshrined in the prescriptive edicts of the ancients. In 1807, he attended two courses of lectures at the University of Edinburgh, before moving to the metropolis for three years' hospital training at St.Bartholemew's. His own course of lectures on special and general pathology and the practice of medicine, as Regius Professor after 1817, drew extensively on his prior clinical experience. Haviland's ultimate objective was to found a 'complete' medical school at Cambridge - a goal he pursued with the same determination and zeal Acland displayed in campaigning against a complete school at Oxford.(107)

Cambridge medical students, as observed in chapter two, developed a working relationship with St.Thomas' Hospital to supplement their formal schooling with instruction in the rudiments of medical practice. After its opening in 1776, it was also possible for some students to accompany surgeons at Addenbrooke's Hospital in Cambridge, albeit on a private commercial basis.

Haviland, however, was the first Regius Professor to attempt to give clinical experience a serious and systematic role in the University's medical education.(108) In 1834, a regulation making two years' hospital practice compulsory for all medical students was the first formal recognition of the necessity for clinical work outside the University's sphere of jurisdiction. Haviland himself gave clinical instruction on the wards during term-time.

As at Oxford, the practice of anatomical dissection had been allowed to lapse, partly because of the shortage of subjects, but also on account of the haughty social pretensions of physicians still reluctant to concede that manual anatomical labour was anything other than the lowly provenance of inferior surgeons. Haviland never saw the full realisation of his plans for a 'complete' school, but succeeded by 1842 in making clinical examination of hospital patients a compulsory element of the examination for MB. Haviland's introduction of regular clinical lectures in medicine and surgery, together with the socio-cultural changes embodied in 'the revolution of the dons', prepared the ground for the innovations of his successors, George Paget and George Humphry, and ultimately, for the establishment of Michael Foster's research school in physiology.(109) Before mid-century, however, certain institutional characteristics of the University operated to forestall the emergence of a formal 'research school'

in any of the biological sciences.

As at Oxford too, collegiate and clerically-controlled wealth served to dampen the reforming energies of Cambridge's scientific proselytisers. In the eighteenth century, collegiate autonomy was not incompatible with the prosecution of vigorous, if informal and under-resourced, scientific activity; but when scientific medical education reached the point in its historical evolution at which centrally-organised and financed laboratory work became an integral component, collegiate independence became an institutional bottleneck. The main contention of Winstanley's study of Cambridge was that the tenacity of traditional collegiate sentiment underwrote a form of internecine warfare that long inhibited reform.(110)

The ownership and canalisation of financial resources was the principal source of dissension between the University and the Colleges. In 1842, the University authorities complained of impoverishment, yet Trinity College alone possessed a vast income of 45,200.(111) Individual colleges were disproportionately wealthy, jealous of their independence, and reluctant to pool their resources to support scientists' demands for laboratories, lecture rooms and other facilities. The central University possessed insufficient resources to supply professors with adequate remuneration. Private tuition, denounced by radical critics as a pernicious and insidious practice, was primarily a collegiate

rather than University abuse. Autonomous colleges, excessively wealthy but relatively ineffectual, faced a University relatively impoverished but potentially powerful: scientific reformers' main problem was that struggles to shift the balance of power in favour of the University threatened collegiate interests with usurpation of their wealth.(112) This fundamental structural contradiction helps to explain why a thriving research school in the bio-medical sciences did not take root in Cambridge before 1870.

The Royal Commission of 1852 criticised the University's central structural problem, but found the Cambridge authorities less remiss than their counterparts in Oxford. The Report recommended opening fellowships and scholarships to free competition, increasing the authority of the university professoriate, and investing more funds in support of 'modern' studies, general and scientific. After the appointment of an Executive Commission, an Act was passed in 1856, which allowed dissenters to matriculate and graduate as Bachelors of Arts (though not yet to receive the MA, MD, or to become fellows) encouraged more scientific studies, and sought to raise academic standards in medicine.(113) The Commission's proposals were radical enough to incur the disapprobation of the ageing Whewell, but in reality were largely conservative, leaving the basic structural tension between wealthy colleges and impoverished University

intact.(114)

Large-scale educational reform, radical enough to create a flourishing research school de novo, cannot be attributed merely to the formal existence of official commissions or government legislation. Curricular innovation had been under way for four years by the time the Royal Commission's Report was published. In 1848, two new Triposes (in Moral and Natural Science) came into existence.(115) As with Oxford's equivalent Examination Statutes of 1850, this curricular reform was introduced only because the University authorities were persuaded that it was wholly compatible with the revered doctrine of liberal education, unthreatening to religious orthodoxy, and would forestall more thorough-going changes. The impact of the new Statute on the University's scientific education was at first disappointing. Some anatomy and physiology was included in the first examination in Natural Science of 1851; but only forty-three students sat the examinations in the first decade; and there were only six candidates in 1861(116), by which time it was possible to receive an Honours Degree in the subject.

Nor were the facilities and apparatus at Cambridge any more than at Oxford such as to encourage effective teaching and research in the biological sciences. Some small chemical laboratories and a botanical garden had long existed in Cambridge; but not until Haviland's tenure of the Regius Professorship were systematic moves

undertaken to extend provision for teaching medical science.

At the University as opposed to the collegiate level, competition over resources was rife and the Senate was reluctant to grant funds in support of academic projects which appeared to attract little demand from students and little enthusiasm from the dons. Financial disputes again proved a critical factor working against the establishment of an effective research school in the bio-medical sciences. Even the example of Oxford's notoriously reactionary dons eventually approving the construction of a Hunterian Museum did not quell opposition to equivalent schemes in Cambridge. Not until 1863 was a relatively modest plan to build a scientific museum at a cost of 23,000 approved by the Cambridge Senate; and not until 1865 were students reading for degrees in science able to use its facilities.(117)

The curricular concessions embodied in these initiatives did relatively little to undermine an educational philosophy which gave precedence to teaching and pedagogy far above advanced scientific research. At both Oxford and Cambridge, the scientific Museums were more suitable for the prosecution of "old and relatively settled sciences"(118) such as geology, mineralogy, morphology, taxonomy and astronomy than for undertaking the kind of experimental research increasingly commonplace in France and Germany by mid-century. The Museums gave medical students an environment suitable

for the study of descriptive or topographical anatomy, but scarcely for the prosecution of experimental, vivisectional physiology.

During the two decades prior to Michael Foster's auspicious appointment to the Praelectorship in Physiology at Trinity College in 1870, medical studies were largely taught (after Haviland's demise in 1851) by Sir George Murray Humphry, Sir George Paget and Professor J. Clark. Humphry (1820-1896) is a much neglected figure who deserves more scholarly research than he has received.(119) Humphry began his medical career at sixteen when he was apprenticed to a lowly provincial surgeon, John Green Crosse. Like other aspiring doctors from the lower-middle classes, Humphry pursued his professional training in the metropolis - at St. Bartholemew's Hospital. He became a qualified general practitioner by sitting the standard examinations of the RCS and the WSA.

With his qualifications behind him, Humphry moved to Addenbrooke's Hospital, Cambridge where he became, at the tender age of twenty-two, the youngest practising surgeon in England. He cultivated medical and surgical interests, earning a reputation in both these fields as an outstanding lecturer and teacher. He adopted a Socratic mode of pedagogy and was a staunch advocate of strict accuracy in note-taking. By the late 1850s, Humphry possessed a Cambridge MB, MD (with a thesis on the formation of clots in the venous system) and was

a Fellow of the Royal Society. Despite his immersion in the academic life of the University, Humphry continued to practise and lecture in surgery at Addenbrooke's Hospital for decades.

Humphry's academic work reflected his social origins, his distinctive pattern of training, and his experience in the operating theatre and the wards. He consistently championed the centrality of surgery, surgical anatomy and pathology to medical education. In 1829, he delivered a course of twenty-eight lectures on surgery which were published in the *Provincial Medical and Surgical Journal*. His "Treatise on the Human Skeleton, Including the Joints"(120) of 1858, was recognised as one of the earliest attempts to reconcile the subject-matter of human anatomy with the contemporary findings and discoveries of scientific morphology. As President of the Surgical section of the BMA in 1864, Humphry took the opportunity to advance the cause of pathology as the very bedrock and cornerstone of surgical practice, and to lament the ancient English Universities' undeniable neglect of the science of surgery. From his position as deputy to Professor William 'Bone' Clark, the Professor of Human and Comparative Anatomy at Cambridge, Humphry was elected to the Chair of Human Anatomy in 1866. In the same year and in collaboration with William Turner (1832-1916), Professor of Medicine at the University of Edinburgh, Humphry founded a new scientific journal entitled the

"Journal of Anatomy and Physiology", in which some of his own studies in anatomy and surgical pathology were published.

George Humphry's real importance in the history of medical education resides in the breadth of his interests, and the comprehensiveness of his vision of the biological sciences. His clinical experience in the operating theatres and on the wards of London and Cambridge Hospitals, whilst stirring his abiding interest in the surgical art, did not give rise to the kind of one-sided obsession with the virtues of 'practice' over 'theory' or 'empiricism' over 'rationalism' which frequently gave clinical discourse a polemical inflection in the mid-Victorian period. Humphry fought a long campaign for the recognition of human anatomy as a distinct, intellectually challenging science in its own right. Though not trained as an experimental physiologist, Humphry nevertheless proved an effective spokesman for the claims of experimental physiology; and in his commitment to the intellectual value and cultural edification of scientific principles, he was at one with friend and colleague, Michael Foster. Humphry's professional support during the 1870s and 1880s was one critical factor in the latter's successful creation of a modern research school in physiology.(121)

The third member, in company with Humphry and Foster, of Cambridge Medical School's Victorian triumvirate was Sir George Paget (1809-1899). He underwent a traditional

education at Charterhouse and Caius College Cambridge, where he graduated BA in 1831. Yet he spent the winter of 1833-1834 in the crowded hospitals and medical schools of Paris, then regarded as a veritable mecca for the serious student's acquisition of professional education. Like Humphry, Paget also spent some time at St. Bartholemew's Hospital Medical School. In 1839, he became Physician to Addenbrooke's Hospital where he remained on the medical staff until 1884. Paget was instrumental in securing a number of reforms - making clinical examination of patients a compulsory component of the MB, and introducing written papers and practical tests (rather than just a Latin viva) into the examination.

He was also one of the main instigators of the Natural Science Tripos of 1848; advocated strengthening University (as opposed to collegiate) power and authority; and actively campaigned for the construction of museums and laboratories to promote scientific education in Cambridge. Paget's support for these innovations in no way compromised the philosophy of liberal education, which remained the sine qua non of gentlemanly culture and civilisation. Indeed, Paget was a lifelong and uncompromising apologist for scientific medicine on intellectual and cultural, but emphatically not purely 'professional', grounds. In 1864, as President of the BMA at its first meeting held in Cambridge, Paget insisted:

"<w>e do injustice to medicine if we treat it as a mystery. It is a science and entitled to rank as such ... and we should be ready to show that its maxims are founded in truth and reason."(122)

Like his fellow members of the triumvirate, Paget cultivated broad interests and sought a degree of symbiosis between medicine and surgery, theory and practice. His impassioned defence of the principles and methodology of science went hand in hand with a staunch commitment to the traditional clinical philosophy on the ultimate ends of medicine. In the last analysis, Paget subordinated the claims of experimental science such as physiology and chemistry to those founded upon clinical experience. In 1869 medical opinion was polarised between those who expressed differential allegiance to the symbolic goals of the scientific 'word' or the clinical 'ward'. As Paget articulated his convictions on this critical debate:

"having spent nearly equal periods of study first in physiology and morbid anatomy, and then in practical medicine and surgery, I am sure that clinical science has as good a claim to the name and rights and self-subsistence of a science as any other department of biology; and that in it are the safest and best means of increasing the knowledge of diseases and their treatment ... <r>eceiving thankfully all the help that physiology or chemistry or any other sciences more advanced than our own can give us, and pursuing all our studies with the precision and circumspection that we may best learn from them, let us still hold that, within our range of study, that alone is true which is proved clinically, and that which is clinically proved needs no other evidence."(123)

Paget's Presidential contribution to Cambridge

University's Philosophical Society and his espousal of public health as an essential component of medical education are further instances of his breadth of vision. It is symptomatic of the degree of social approbation accorded to public health as a discipline on the medical curriculum that Paget's enthusiastic agitation on behalf of the subject did not gain official sanction until 1875 when a course in sanitary science was introduced; and a formal 'Diploma in Public Health' gained acceptance by the University only in 1877.

Paget's career (which included Presidency of the BMA, the GMC, and Fellowship of the Royal Society) culminated in 1886, when he delivered the Harveian Oration at the Royal College of Physicians. He underlined the continuing relevance of the Stuart physician's exhortation "to search and study out the secrets of nature by experiment." (124) Paget's vindication of the applicability of this pristine experimental philosophy to the education of medical students at Cambridge (directed, of course, to clinical and practical ends) rendered him, with Humphry, an effective ambassador of Foster's yet to be realised pedagogical ambitions for the bio-medical sciences. (125)

Before approximately the last third of the nineteenth century, medical studies at Cambridge University remained sui generis in comparison with rival 'progressive' medical schools on the continent. The (non-experimental) study of anatomical structure still

claimed priority in the University's medical curriculum; insofar as the study of physiological function was recognised as a necessary element of medical education, it was invariably simply correlated with anatomical structure.

Physiology was still largely taught in terms of theoretical principles rather than heuristically as an experimental science. The relatively embryonic state of the faculty was reflected in the small number of students registering at Cambridge to study the subject. In the 1850s, notwithstanding the innovations of Humphry and Paget, only four students per year graduated out of the entire University.(126) As rival centres of medical education and training mushroomed, the competition became a matter of increasing concern to educators at Cambridge, particularly in the light of criticism from middle-class quarters about the privileged social origins of the bulk of the University's students. The Regius Professor of Medicine made these matters the subject of public discussion when he complained that the social exclusiveness of Cambridge was driving potentially good doctors into the arms of the newly-created University of London.(127)

How to prevent this discernible gravitation of medical students to the metropolis, which offered incomparably better and more abundant clinical facilities, was hotly debated among the Cambridge medical fraternity. Michael Foster understood that his

high ambitions for experimental physiology in Cambridge depended on effecting a renaissance of the moribund medical school.

Conclusion.

By the mid-nineteenth century, the aims and objectives - scientific and educational as much as political and religious - of the ancient English Universities' radical Benthamite utilitarian critics had been realised at neither Oxford nor Cambridge. As some early Victorian scientists recognised, the absence of governmental patronage for tertiary education - a reflection of the dominant 'laissez-faire' political ideology - was a major stumbling-block in the way of securing professional employment commensurate with their scientific interests, economic expectations and social aspirations. Many also realised that reforming Oxbridge was critical to their professional goals; for these Universities (citadels of reactionary theology, repositories at the collegiate level of abundant resources, and highly-esteemed institutions) could be adapted for their own purposes, supplying wider career opportunities and valuable social legitimation.(128)

From a sociological standpoint, the attempt to extend the provision of scientific studies in tertiary education and to shift the locus of scientific culture from a position of marginality to one of centrality, is an example of the collective 'encroachment' which has been the characteristic behaviour of professionalising

groups. Victorian Oxbridge was a crucial institution for reformers to encroach upon and to redefine in terms favourable to scientific rather than classical or religious culture.(129)

Yet the professionalist strategy of encroachment in pursuit of much-needed social legitimation was not pursued with total success. As aspiring professional scientists never tired of repeating even in the late-Victorian period, the English Universities were not conceived as, and had not developed into, academic centres whose central purpose was the advancement of knowledge through research. Provincial universities were to prove more congenial to science, but scientific reformers were confronted with the obstinate truth that Oxford and Cambridge held such a pre-eminent position in English society that full realisation of their goals hinged upon the acceptance of the value of science on the old universities' curriculum.(130)

The fate of medical education at Oxford largely depended on the same contingencies, and structures, as the above. This is partly a reflection of the artificiality of separating the physical from the biological sciences at a time when intellectual discourse was pervaded by a 'common context' of enquiry in which boundaries between disciplines were highly permeable.(131) 'Natural Science', understood as the discipline brought into being by the Oxford University Statutes of 1850, excluded medicine; but in the earlier

period they cannot be separated as chemistry and botany, for example, were subjects ancillary to medicine rather than autonomous 'scientific' disciplines.(132) Henry Acland, as we have seen, was general of the forces campaigning in Oxford for the extension of the natural and medical sciences alike. Oxford's medical faculty effectively 'disappeared', losing its separate identity through fusion with the Honours School of Natural Science, until reconstituted with the arrival of John Burdon-Sanderson in 1883.

Cambridge's Medical Faculty at least managed to avoid extinction, but in one critical respect paralleled its sister University: Humphry, Paget and Foster were unanimous in their opinion (identical to Acland's) that the interests of the medical profession would be furthered to the extent that its members were able to acquire a medical education to the highest possible academic standards in the principles, methodology and techniques of experimental science pursued in connection with clinical problems in the rarefied, culturally edifying and civilising milieu of the university. Because the reform of medical education was perceived in close connection with the reform of natural science, it is improper, if not positively misleading, to discuss medicine in isolation from developments in its 'basic' sciences.(133)

Seeking to proffer a long-term assessment of medical education at the ancient English Universities before the

1860s, Franklin has contended that

"<u>ntil the middle of the nineteenth century Oxford and Cambridge contributed little to the medical sciences, but they were an important influence in the profession because of their social significance."(134)

This contention is historiographically misleading in perpetuating the basic ontological dualism between a domain of 'scientific' medical ideas and a supposedly hermetically-insulated social context. It retains too much of the terms of the passe debate between 'internalist' and 'externalist' historians of science. Secondly, this judgement is factually misleading insofar as it neglects to qualify the traditional portrait of a university medicine whose 'immaturity' and 'sterility' is seen as the inevitable consequence of teachers' rudimentary grasp of 'scientific' principles and procedures. Not only does this interpretation reinforce the judgemental positivism that critically distorts medical history by implicit conferral of privileged epistemological status on more 'mature' sciences (such as experimental physiology after 1870); it also fails to give sufficient weight to evidence of the continuing vitality of some of the biological sciences at the universities, notwithstanding the metaphysical and religio-philosophical concerns with which many dons were preoccupied.

Yet there is an important sense in which Franklin's observation legitimately highlights the sociological

dimensions of medical education during this period. Before the emergence of 'professionalised' scientific medicine, it was undoubtedly the prior training in arts subjects rather than formal medical qualifications which impressed elite circles in the RCP; and this lay at the basis of their unrelenting refusal to grant fellowships to any but 'superiorly educated graduates' from Oxford and Cambridge. The justification for this practice of exclusionary closure was articulated by Sir Henry Halford as President in 1834. For it was entirely due to the universities, in his opinion, that there had

"never been wanting a succession of learned and able men, who <had> been distinguished by their great attainments, and <had> added a dignity to <the> profession which <had> raised it pre-eminently in England above the consideration it had <obtained> in any other country in the world."(135)

It might be thought that so few medical students passed through the cloisters of Oxford and Cambridge, with an even fewer number graduating, as to render the history of university medical education inconsequential. Yet of the physicians employed at London teaching hospitals in 1850, no less than fifty-five per cent were graduates of either Oxford or Cambridge(136) - a statistic which suggests the need to temper such speculation.

CHAPTER SIX

COMPETITION FOR OXBRIDGE: MEDICAL EDUCATION AT THE UNIVERSITY OF LONDON.

University College, London.

With the failure of Thomas Gresham's attempt to establish an institution for higher education in the metropolis in the sixteenth century, London differed from most European capital cities in the early nineteenth century in not possessing a university. Given the social and religious exclusiveness of Oxbridge and the swelling ranks of the middling orders of the population, the non-existence of a university in London had become, by the 1820s, one of the most pressing issues of public debate. Scientists and manufacturers who demanded practical technical education; secularists and nonconformists excluded on religious grounds from full participation in English society; and disgruntled Benthamite radicals and utilitarians anxious to promote educational reform to the advantage of the growing industrial and commercial middle class - these were the social groups which played the most active part in the agitation for a new university in London.(1)

The poet, Thomas Campbell, took the first initiative in launching a campaign to the end of "effectively and multifariously teaching, examining, exercising and rewarding with honours, the liberal arts and sciences, the youth of our middling rich people."(2) The complex amalgam of aims and objectives, ideals and interests, of the various social groups its founders represented gave

the new institution its distinctive character.(3)

Its constitution was explicitly secular and non-denominational, challenging Anglican religious orthodoxy and the hitherto unassailed ecclesiastical monopoly of higher education.(4) As numerous Anglican Tory critics took pains to observe, the admissions policy of the institution's governing authorities opened the door not only to nonconformists, low church evangelicals and agnostics but embraced even "Jews, Turks, infidels and heretics." Indeed, the 'godless college of Gower Street' was, in the eyes of the defenders of the established Church, the very fons et origo malorum and a portent of far worse evils to come.(5)

UCL did not break with tradition in respect of religious matters alone. Its unabashed business character - it was organised as a joint-stock company and financially controlled by independent shareholders - represented a bourgeois rejoinder to the inherited privileges of aristocratic Oxbridge. The breadth of the curriculum reflected the founders' determination to avoid the shortcomings of education at the ancient seats of learning. UCL's syllabus included not only classics and mathematics as sanctioned at Oxford and Cambridge, but the 'progressive' sciences of botany, chemistry, experimental philosophy, geography and economics in addition to the traditional liberal education of the established old professions of law and medicine, but not

the Church.(6)

Both the curriculum and the organisational goals of the University bore witness to the imprint of foreign models. As Bellot has usefully summarised it:

"<t>he extended range of the subjects of university study, the lecture system, the non-residence of the students, their admission to single courses, the absence of religious tests, the dependence of the professors upon fees and the democratic character of the institution, were all deliberate imitations of Scottish practice"(7)

Largely on account of the strength of Calvinist sentiment in Scotland, her universities had themselves been modelled on continental universities. A curriculum conceived with philosophy at its epicentre; greater stress on professorial rather than tutorial models; and admission of students from a greater range of socio-economic backgrounds: these were certainly the most obvious departures from long-established Oxbridge educational practices. Nearly half of UCL's newly-created chairs were filled by Scotsmen - clear evidence of a strong Scottish connection.(8)

UCL's Medical School was critical to the institution's survival in its beleaguered first years. The founders of the College saw medical education as the lynchpin of the whole new enterprise.(9) That the Medical School's innovations represented a new departure in the history of English medical education was a testament to the radical-bourgeois objectives of its creators. In what precise ways did UCL's Medical School

differ from established practices, and with what consequences?

In the 1820s, criticism of the bribery, nepotism and corruption in metropolitan medical education was mounting. The major abuses of the London schools were a product of the market structure of their organisation and financing, which rendered medical education a mere commodity to be bought and sold like any other. At London's private schools of anatomy, in particular, teachers engaged in competitive struggle to lower fees in order to receive a wider share of an expanding market. This pervasive economic framework (sanctioned and extolled by Adam Smith in Scotland where it underpinned university medical education) explains the piecemeal, ad hoc and unco-ordinated way English medical schools proliferated in the metropolis and the provinces.

The founders of UCL Medical School expressly endeavoured to establish an institution in which a crudely practical and empirical form of medical instruction might be transcended by (or at least supplemented with) a liberal measure of grounding in 'scientific' theoretical principles. The governing council envisaged and devised an integrated and systematic programme of medical studies entirely in one centre, thereby obviating the inconvenience of travelling from one private school or infirmary to another.(10)

Seeking to fulfil the wider objective of making UCL a home of science, professionalism and humanity, the founders of the Medical School endorsed a curriculum which encompassed as comprehensive a range of disciplines and practices as was possible while still allowing students to acquire their professional qualifications. From the outset, regulations were framed to comply with the official stipulations of the two major licensing bodies - Apothecaries Hall and the Royal College of Surgeons. Yet over and above simple provision for the LSA and MRCS, the Council sought to promote more intensive study of certain branches of medicine, and an understanding of the theoretical principles of scientific medicine.

The scope of the full four-year curriculum is set out in Table 6'A'. The Council's initial expectation that most students would remain at the school for the full four years and thus acquire a comprehensive, multi-faceted medical education was confounded as the majority took advantage of the American-style 'elective' system, attending only courses relevant to the professional diplomas they sought. On grounds of expense and because standards were exacting, relatively few aspiring doctors registered for studies which were irrelevant to their vocational interests.(11)

Another important respect in which the Medical School differed from time-honoured and inveterate modes of practical, empirical medical education stemmed from the

strong belief of its founders in the pedagogical centrality of the lecture in medical studies.(12) This consciously sought-after objective demands emphasis, if only for its value as an ironical commentary upon conventional historiographical wisdom which berates the egregiously myopic 'refusal' of university-educated physicians to embrace 'scientific' medicine. For 'illegitimate' social reasons, according to whiggish historiography, university physicians stubbornly persisted in spinning those rationalist cobwebs of medical learning which Bacon and his successors had failed to put entirely to rest. Entrenched in the ivory towers of Oxford and Cambridge, physicians held aloof from the salutary empirical lessons of surgery and thus 'failed' to recognise the arrival of 'truly scientific' medicine.

The explicit goals of the founders of UCL's Medical School, however, suggest an almost diametrically opposite interpretation of the relationship between medical science and pedagogy. For the Council saw the main defects of existing metropolitan medical education as a product of the absence of 'scientific' principles. By its endorsement of the educational value of the lecture, the Council sought to raise academic standards and achieve a shift in the centre of gravity of medical education away from the merely empirical towards more elevated scholarly and cultural objectives. The Council's commitment to these changes is one clear

instance of a perceived connection between a particular mode of pedagogy (the lecture), and a specific goal-orientation (the restructuring of medical education upon a scientific and theoretical rather than an empirical and practical basis).

The Council's 'scientific' objectives in no way precluded full provision for a 'complete' medical education. The founders of the fledgeling medical school cultivated an association with the Middlesex Hospital (where its own future teachers, Charles Bell and Thomas Watson, were based), but the relationship proved strained and was short-lived when the hospital and university authorities clashed over the organisation and control of clinical education.(13)

UCL embarked on a project to have its own hospital constructed so as to fulfil its students' clinical requirements independently. The idea of building a hospital in connection with the medical school had been conceived by the Council from the inception of the whole enterprise, but detailed proposals were not submitted until 1832. The construction of a new hospital at UCL, as the authorities later recalled, was entirely concordant with "the leading idea with which the Medical School was founded, viz. that it should be the means of supplying a Medical Education superior to any at that time attainable in this country."(14)

Gower Street's hospital (at first called the North London, but which subsequently became known as

University College Hospital) was opened to university medical students for the first time in 1834. The first hospital in England explicitly designed to supplement the academic programme of a university medical school with clinical facilities and clinical instruction, its historic significance must be underlined.(15)

The potentially seismic consequences of historic links forged between the theoretical, academic medicine of the university and the stark, pathological medicine of the clinic have been noted in earlier discussions of Foucault and French medicine. That the institutional amalgamation of school and clinic might profoundly transmogrify the intellectual, even the epistemological, parameters of scientific medicine was implicitly suggested by E.A.Parkes, Lecturer in Clinical Medicine at University College, in an address to students in 1856. Parkes explained how much assistance had been given to the typical student of medicine or surgery "by the power of constantly aiding the teaching of the lecture-room by the practice of the hospital." It was imperative, in his view, that the two modes be conducted together, for

"neither alone <would> suffice: the knowledge contained in books <was> to be imprinted by the lessons of the ward, and the actual phenomena of disease must give life and interest to the descriptions in books. No student <would> do justice to himself or to his art if he neglect<ed> either mode of teaching."(16)

The College Hospital's provision for the medical care

of London's indigent poor allowed a more integrated mode of medical education to develop according to the principle of co-ordination between 'scientific' lecture courses and 'clinical' hospital instruction. The first institution to imitate UCL's example was its rival, King's College; the critical principle of integration it embodied was subsequently adopted by numerous metropolitan and provincial schools.(17)

In 1834, the first academic year for the new hospital, UCL had a total of 469 students, of whom 347 (approximately three out of four) were medicals.(18) To a considerable extent, the early meteoric rise of the institution is attributable to its medical faculty's ability to cater for the numerous demands of metropolitan medical students. Table 6'B' documents the rise and fall of student numbers both within the medical faculty itself and as a proportion of the total student body between 1828 and 1858; it reveals the initial popularity of the Medical Faculty's provision for university education in scientific medicine and for clinical instruction in one centre. Without the impetus of the new thriving medical faculty, the very survival of University College might have been seriously jeopardised.(19) The buoyancy of the faculty during a sharp financial crisis in 1833 was particularly significant in this regard.

By this time it was apparent that if UCL was to fulfil the aspirations of its founders (meeting the

educational demands of the hitherto educationally-deprived middle classes) it must overcome its inability to grant its students a viable university degree. The precise status of the 'University of London' in Gower Street had been debated ever since its establishment. The inauguration in 1828 of a rival institution founded on a Church of England basis and known as King's College, London gave impetus to a movement for an official Royal Charter to establish a 'University of London' with the power to confer bona fide degrees.(20) Largely on account of the entrenched vested interests this project threatened, a prolonged campaign ensued (notable for an unholy alliance between the editors of the 'Lancet' and the authorities of the ancient English Universities against the scheme) before a Royal Charter was duly granted in 1836.(21)

According to its terms, the Privy Council established and recognised the existence of a separate examining body known as 'The University of London' with the power to grant degrees in Arts, Law or Medicine, after examination, to candidates who had completed courses at University College or King's College or other such approved institutions.(22)

Inherent in the structural situation established in 1836 was a problem which would later escalate into a large-scale crisis. By the terms of the Royal Charter, the University of London was effectively little more than an organisation for examining candidates and

conferring degrees rather than a legitimate teaching body; affiliated colleges possessed no organic relationship with the University. The root cause of the later crisis stemmed from its establishment as 'London University' at a time when the proper role and function of the university was not settled, but a deeply divisive and contentious political issue. At first, the University of London fulfilled its new-fangled educational role affiliating, in its first seven years, more than twenty collegiate institutions, a number of English medical schools, and even the University of Malta and the Military Hospital of Ceylon. The tenuous and complex relationship between the University and its various affiliated bodies terminated in 1856 when the former's role shifted yet again to become a straightforward examining board.(23)

Having elucidated the major educational developments taking place at University College, London from its inception in 1827 until its changed situation in 1858, it now becomes critical to focus more closely on the medical department, its personnel and the teaching carried out there. In this way, we shall highlight one aspect of this history of considerable sociological significance - the association between the persistence or decline of a particular form of medical knowledge and changes in the institutional settings in which it is 'produced'.

It will be recalled that remedying the widespread

abuses of metropolitan medical education was the overriding purpose of the architects of University College's medical department. In the early nineteenth century, London's medical training took place at schools attached to the great hospitals, or at privately-owned and commercially-organised anatomical schools.(24) The cardinal evils of the existing system were attributed by the Benthamite-inspired reforming interests on the University College Council to the proprietary basis of these anatomical schools, and the inefficient organisation and lack of productive division of labour it fostered. University College Medical Department, by contrast, was to be a model of efficiency and usefulness, substituting "the co-operative labour of specialists for the haphazard services of private lecturers."(25)

Sir Charles Bell (1774-1842), newly designated UCL's 'Joint Professor of Anatomy and Physiology, Morbid and Comparative Anatomy, and Surgery' (together with Granville Sharp Pattison and, initially, the famous German anatomist Friedrich Meckel of Halle) referred in his inaugural lecture of 1828 to a grave "disadvantage of the mode of conducting our medical schools", which he attributed explicitly to "the too numerous engagements of the heads of the school and a want of the necessary division of labour."(26) Bell, with more than fourteen years' experience of organising and teaching anatomical classes as principal of the Great Windmill Street

School, was in a position to speak authoritatively on the subject.(27)

During this period, Sir Charles Bell had become one of Britain's foremost anatomists and leading exponent of that peculiarly British hybrid known as 'anatomical physiology'. He was educated at Edinburgh between 1797 and 1803 together with his brother John, who had opened his own private school of anatomy there in 1790. Bell moved to London in 1804 to commence teaching anatomy at his own home before purchasing a large share in the enterprise at Great Windmill Street in 1812.(28)

Cultivating specialist interests in the operation of the human nervous system, Bell acquired a formidable reputation as an expert on neuro-anatomy and neuro-physiology largely on the strength of his treatise on the anatomy of the brain, in which he elaborated his distinction between the anterior and posterior roots of the spinal nerves.(29) His principal concern was to establish the functions of different parts of the brain in relation to specific regions of the cerebrum, somewhat analogously to his contemporary, Bichat, who endeavoured to localise the functions of the body in relation to its particular tissue structure.(30)

Bell was first and foremost an anatomist, a product of a strictly anatomical training which characteristically bred a strong distaste for the vulgarity and barbarism of vivisectional experimentation, and imbued a methodology which gave

priority to static correlation of physiological function with anatomical structure. Bell did perform some experiments, but more important was the pride he took in claiming that all his discoveries were no more than "deductions from anatomy." (31)

It is well known that as the nineteenth century progressed, British 'anatomical physiology' offered an ever more glaring and conspicuous contrast to the experimental mode of physiology widely accepted on the continent by the 1850s. Unfortunately, the exceptionally complex question of the relationship between British and continental physiological models in relation to pathological medicine, has become even more clouded and obscured by a fog of positivist rhetoric about the 'stagnancy' of English physiology between the 1840s and the 1870s. (32) Only when medical historians abandon the facile normativism of such imagery is a more reasoned analysis likely to be proffered. (33)

If the conventional portrait unnecessarily derogates the physiological labours and achievements of Sir Charles Bell and others of his generation, the term 'anatomical physiology' does nevertheless connote something distinctive about the peculiar intellectual condition of English physiological studies in the first half of the nineteenth century. Lloyd Stevenson has argued that anatomical reasoning proved so secure a foundation for physiological thought in Britain as to endure for more than three centuries. (34) Not before

1870 did physiology emerge as an autonomous scientific discipline separate from metaphysical and religio-philosophical concerns, and also from the fetters that had constrained it in too close connection with the traditional practical demands of clinical medicine. In the immediate decades before the symbolic emancipation of experimental physiology in 1870 (which, omnium consensu has been regarded as an annus mirabilis in the history of British medical science) the resilience of anatomical reasoning was evidenced by a strong and influential school of comparative anatomy and histology.(35) The history of medical education in London during this period offers a classical illustration of the conflicts engendered by these developments in British life science.

If all this is well-known and oft-documented, the relation between the growth and decline of this dominant concept of anatomical reasoning (36) and the different institutional settings in which physiologists learned, taught and worked at their science has not been fully explored by historians.

The proprietary anatomical school certainly proved a supportive institutional matrix for the kind of 'higher' anatomy exemplified by Sir Charles Bell's work on the structure and functions of the nervous system. The main object of the private schools was to attract large numbers of medical students (and thus maximise profitability) many of whose intentions were, in turn,

frankly practical and mercenary. The main business of the private schools was to equip students with the rudiments of anatomy, enable them to secure professional diplomas from the medical corporations, and qualify them to engage in general medical practice.

Lectures, demonstrations and anatomical dissections were the stuff of London's private schools, and surgeon-anatomists their leading dramatis personae. In the late eighteenth and early nineteenth centuries, there was an elective affinity between 'anatomical physiology', conceived as a distinctive framework for the prosecution of bio-medical investigation, and the material substructure and institutional basis of the proprietary school.

Sir Charles Bell's decision to accept University College's offer to become its first Professor of Anatomy induced him to sell his shares in the lucrative Windmill Street School to his former student and associate, Herbert Mayo - an action showing the strength of Bell's commitment to his new position in the university context. Bell was entirely in sympathy with the Council's goal of raising academic standards in medicine, and firmly believed the new department could overcome the very absence of specialisation or division of labour which he had condemned in his inaugural lecture. He also assumed that the relocation of his career at an entirely different kind of institution would present no particular difficulties; and that his

own specialised work on the neuro-anatomy and neuro-physiology of the brain and nervous system would proceed apace, unruffled by environmental tergiversations.(37)

In this respect, Sir Charles Bell's expectations were rudely shattered in the new department's first years, which witnessed acrimonious disputes and internecine conflict over the very issue of the division of labour within the school which had initially enticed Bell to accept the Professorship. The acerbic quarrels which plagued the medical school cannot be attributed solely to the strength of personal antagonism between individual teachers; they are rather a product of the absence during this period of any paradigmatic disciplinary matrix for anatomical science.

The domain, provenance and quidditative ontological foundation of anatomy were not fixed or apodictic matters but essentially contested questions open to a process of social negotiation which frequently precedes and accompanies paradigm-shifts in the history of science. Rival conceptions of anatomy recognised different cognitive boundaries as denotative of the legitimate frontiers of the discipline and hence announced different terms of relationships with sister disciplines like physiology. Demarcation disputes within disciplines cannot be understood as simple reflections of the way nature objectively compartmentalises reality. As altercations between medical teachers at UCL clearly reveal, rival conceptions of 'scientific' disciplines

often reflect social contingencies, such as the disputants' different patterns of education and training, and the interests - in prediction and control, and wider social interests(38) - which they bring with them into the crucible in which contending claims about disciplinary boundaries are articulated and compounded historically. Examination of the serious difficulties encountered by Charles Bell in his new career will illumine the complex social dynamics of disciplinary negotiation and growth in relation to English life science.

UCL's Council rescinded its initial invitation to Johann Friedrich Meckel to become the leading figure in the new medical school because of his insistence on unreasonable terms in connection with the appointment. Bell's senior professional colleagues were, in the event, G.S.Pattison, John Connolly and J.R.Bennett. The Council's failure to specify exactly how professorial duties and responsibilities would be apportioned proved inimical to the effective and harmonious operation of the medical school.(39) Bell was offended by the Council's action in informing him that his Chair was to be divided only after he had officially accepted it. The Council's further refusal to allow him any say in the appointment of a demonstrator prompted his offer to resign. Only the Warden's assurance that he would receive the full co-operation of the Council in organising and teaching the course in 'higher anatomy'

induced Bell to withdraw his resignation on this occasion(40); but the serious problems he continued to encounter in teaching the advanced course in anatomical physiology eventually resulted, in exasperation with the autocratic powers of the lay Council, with his final resignation from University College in 1829.(41)

As envisaged by the Council, the division of labour within the medical department entailed Bell teaching 'higher anatomy'; Bennett, as demonstrator, taking responsibility for practical instruction in the dissection-room; and Pattison lecturing on descriptive or topographical anatomy. This division of labour, however, was destructive of the smooth functioning of the department, as the animosity between Bell and Pattison, and, even more emphatically, between Pattison and Bennett, threatened to consume it in internecine strife.(42) Enmity might have been anticipated in view of the differential social status and financial rewards accruing to the different posts, but cannot be explained adequately with sole reference to such considerations.

G.S.Pattison played the pivotal role in the department's professional disputes largely because of his adherence to a particular tradition of anatomical teaching which was becoming more widely regarded as anachronistic and moribund at this time. The bulk of Pattison's teaching consisted in formal lectures on the 'descriptive anatomy of the bones, ligaments, muscles, arteries, veins, nerves and lymphatics' and also

'Surgical Anatomy'.(43) Pattison had acquired a traditional medical education at Glasgow, but the approach he espoused (oriented around exposition of the dry details of the technical minutiae of descriptive, topographical anatomy) prompted some of his students to complain about his teaching. The students' memorial accused him of

"unusual ignorance of old notions, and total ignorance of and disgusting indifference to new anatomical views and researches ... he is ignorant, or, if not ignorant, indolent, careless and slovenly, and, above all, indifferent to the interests of the science."(44)

Opponents further charged that Pattison was poorly versed in medical Latin (still a mark of philistinism in the eyes of erudite scholar-physicians) and that his lectures were perpetuating an antiquated mode of anatomy which "neglected the physiological linking of anatomical facts."(45) Despite valiant attempts to defend his position, these damaging charges culminated in Pattison's dismissal from University College in 1831.

Students' complaints about Pattison's teaching were vigorously upheld by his principal professional adversary, J.R.Bennett. Initially demonstrator, but later elevated to the position of joint Professor of Anatomy, Bennett's Parisian medical education offered a conspicuous contrast to his rival's in Glasgow. Having gained extensive familiarity as a student in Paris with the general anatomy and histology of Xavier Bichat, Bennett naturally poured scorn on Pattison's 'outmoded'

surgical and descriptive anatomy.(46) The intense personal rivalry between these two individuals had an economic dimension. Bennett's fees were paid directly by students, and growing numbers attending his popular courses diminished Pattison's remuneration; but the real importance of the disputes lies in the conflicting conceptions of the medical meaning of science each party upheld in his teaching.(47)

Pattison's own assessment of his professional difficulties at UCL was perspicacious: "I am complained of because I do not teach 'French Anatomy'", which he summarily dismissed as "idle, extravagant, unintelligible theories misnamed Anatomica." Properly conceived anatomical science, in Pattison's view, found its principal 'raison d'etre' only when brought into fruitful articulation with the protean complexity of individual sickness and disease as revealed in the clinic, i.e. in direct connection with experience of pathological conditions.

Pattison's philosophy of medical education was unambiguously utilitarian; he taught "for the purpose of educating useful medical practitioners."(48) His dismissal in 1831 was perhaps a product of the fundamental incompatibility between the long-established tradition of anatomical teaching defended by Pattison for its clinical relevance, and the Council's objective of raising academic standards by greater emphasis on the theoretical dimensions of anatomy, i.e. its relation to

scientific principles.

Sir Charles Bell's experience of professional difficulties and his ultimate resignation were an even more striking illustration of the manifest truth that scientific disciplines are creatures of history whose shape and form are determined by social, intellectual and institutional contingencies. He was unable to transfer the kind of higher anatomical teaching he had pursued for fourteen years as proprietor of the famed Windmill Street School into the alternative institutional environment of the university. Like Pattison, Bell had financial grievances stemming from the voluntary basis of his courses and the smaller number of students attending them.(49) Nor was Bell unmoved by personal animosities; he shared Bennett's low opinion of Pattison. However, Mazumdar is surely correct in seeing that the real significance of his difficulties lies elsewhere. For Bell's protracted and repeated resignations were a sign and symptom

"not only <of> his personal distress, but also the crumbling of the London tradition of anatomical physiology, of the intellectual tradition as well as the institutional structure that supported it."(50)

The episode perhaps represents an instance of Schlelerian 'social valving' applied to the ideas of scientific medicine. In Schleler's famous analogy, the social and technological conditions existing in a given historical period act as a valve which opens and closes

as these conditions fluctuate in the course of historical evolution. Only when social conditions are favourable will the valve open and will creative scientific ideas germinate. Charles Bell's experience at University College, London perhaps suggests that Schlelerian social valving ebbs and flows in a state of symbiotic tension with particular institutional contexts in respect of medical ideas.(51)

One of Bell's successors, Robert Grant as Professor of Comparative Anatomy perceptively observed in 1833 that

"<i>t <was> only in established universities that a full and comprehensive plan of education <could> be maintained ... for they alone in all countries <were> endowed with the means to ensure permanent protection and talent for the higher and less popular or common departments of knowledge, and to secure that sub-division of labour which the extent of the sciences demand<ed>. These advantages <could> never be established in a private school, where a single teacher <was> compelled to undertake several departments in order to afford him adequate remuneration."(52)

Grant's statement represents not only an accurate summary of his predecessor's immense professional difficulties, but also a vindication of the applicability of Schlelerian social valving theory to this important episode in the history of anatomical teaching at University College.

Pattison's effective dismissal, Sir Charles Bell's seemingly inevitable final departure and the death of J.R.Bennett in 1831 prompted rearrangement of the duties

required of occupants of the medical Chairs. Pattison's Chair was eliminated and anatomical teaching divided into separate subjects of 'Descriptive Anatomy' and 'Physiology'. Bell was succeeded by Thomas Southwood Smith; and Bennett's death again left an Anatomy Chair vacant.(53) The criteria adopted by the Council in deciding whom to appoint to new chairs is revealing of the changes taking place in English life science.

The College Council's decision to appoint Jones Quain in preference to Richard Grainger as successor to Bennett's Anatomy Chair is instructive. Grainger's qualifications were impressive, and he had acquired years of teaching experience at Webb Street Private School.(54) He had also published a highly-acclaimed textbook on general anatomy(55), written in the spirit of Bichat's 'anatomie generale'. Yet notwithstanding this array of accomplishments, the Council declined to offer Grainger the appointment. The decision was taken on the basis of social rather than intellectual considerations, the committee expressing dissatisfaction that Grainger was not "a gentleman of cultivated mind and extensive general knowledge <who> had not the advantage of a Regular Academic Education."(56)

The gentlemanly virtues and liberal accoutrements of rival candidate Jones Quain informed the committee's decision. Quain's publications were learned treatises on noetic and philosophical subjects, including an elegant and scholarly assessment of the pros and cons of

vitalism and teleology in biological thought.(57) Given the committee's pre-eminent concern to raise the department's status in the eyes of the respectable elite, it was inevitable that gentlemanly, rather than utilitarian, considerations proved decisive. A background and training in the long-established tradition of anatomical physiology (acquired in connection with metropolitan private schools) was becoming increasingly incongruous as a means of securing an appointment in a university context.

Five years later, this incongruity was manifest a fortiori when Quain's retirement again provided the occasion for the committee to appoint a successor to the vacant chair.(58) In the event, the Senate decided to establish two separate Chairs - one in Descriptive Anatomy, and the other in Physiological Anatomy.(59) The principal contenders for the latter position included two eminent London anatomical physiologists (Richard Grainger again, and Herbert Mayo) and two Edinburgh-based anatomists (Alexander Lizars and William Sharpey). To the outrage of the London medical community, William Sharpey (1802-1880) secured the appointment.

The committee regarded the London candidates as engaged only in routine anatomy teaching and declined to appoint them notwithstanding indisputable evidence of successful teaching and publications. Grainger was Sharpey's most serious rival, but remained disadvantaged

for the same reasons that had counted against him in his previous bid. One committee member this time belittled Grainger's text after Bichat's '*anatomie generale*' as a mere "compilation" from French sources.(60)

It was again critical that Grainger's medical training had been through the standard surgical apprenticeship: he was schooled in a long-established anatomical tradition. Sharpey, however, not only possessed an MD from the University of Edinburgh, but had also spent a year in Paris - the undisputed mecca for medical education during the early decades of the nineteenth century - both before and after graduating. Sharpey's appointment clearly suggested that surgical apprenticeship and experience of anatomical teaching at metropolitan proprietary schools could no longer purchase the same social and professional cachet as foreign education and ornamental academic credentials in so socially and professionally conscious a world as that of the medical community in early Victorian London.(61)

Sharpey's appointment and the courses he instituted at University College were to acquire considerable importance in the history of medical education as inaugurating a period of transition between strictly anatomical physiology and experimental physiology on the continental model; but Sharpey was himself, first and foremost, an anatomist. Before his appointment as Professor of General Anatomy and Physiology at UCL in 1836, Sharpey's only published scientific work related

to studies of the function of the cilia in different animals with particular attention to chicks, tadpoles and invertebrates. Sharpey retained his position until 1874, but had no subsequent publications. Some of his students, however, did transcribe parts of his lectures whose organisation and structure afford valuable insight into the relationship between anatomy and physiology as scientific disciplines at this time.(62)

In his inaugural lectures, as recorded by John Phillips Potter, Sharpey adopted a three-fold structure which, according to the assumptions of functional anatomy, was dictated by the existence of three universal functions of the human body. "In contemplating the body of man," Sharpey asserted, "we see three principal ends which it must answer, that is three wants which his body must supply."(63) The first, in Sharpey's scheme, was the need for acquaintance with the external world, brought about by the organs of the senses and of motion, fulfilling the functions of sensation and locomotion. The second was the need to repair bodily waste, served by "the organs of Digestion, Absorption(sic), Circulation, Respiration" whose functions Sharpey summarised under the heading of 'Nutrition'. Finally, Sharpey referred to the need for the human race to be continued, and the relevant organs of generation which fulfilled the function of reproduction.(64)

In each instance, structure and function were

correlated after the fashion of the contemporary French generation of anatomists. Sharpey acknowledged a variety of formative influences on his own anatomical work, alluding to Malpighi, Ruysch, Smyth and Pinel, but reserved more emphatic acknowledgement for Xavier Bichat. "<I>t <was> chiefly to his labours," Sharpey informed his neophytes, "that general Anatomy owe<d> its present state." Bichat's most originaive stimulus to medical studies, in Sharpey's view, derived from his histological researches: .

"<h>e entered into an examinations(sic) of the physical and vital properties of the different tissues and the result was a classification of the elementary tissues, dividing them into twenty one kinds. These twenty one different elements he divided into two different groups, General and Local."(65)

Sharpey did not reproduce Bichat's histological classification 'tout court', but derived his own schemata through extrapolation from Bichat's system and also from an alternative framework developed by Richard Dupuytren. As Table 6 'C' indicates, Sharpey advanced a fifteen-tier model of histological classification which differed in some respects from those of Bichat and Dupuytren, but nevertheless owed much to their work.

In 1842 Sharpey underlined the dominant assumption of the functional anatomy of the period - the meaninglessness and the impossibility of studying either anatomy or physiology in isolation from one another. These two subjects, which represented the core of

medicine, were inseparable and necessarily inter-dependent:

"<a>s Anatomy makes us acquainted with the structures of the body, so Physiology with its functions. Anatomy has to do with the dead as Physiology has with the living body - as, for instance, the study of the bones and muscles of the chest belongs to Anatomy, so the mechanism by which air is introduced into the chest in respiration and aeration of the blood to Physiology ... Anatomy describes the parts, as Physiology the functions."(66)

Sharpey's students were taught that physiology resembled anatomy in comprising three kinds of study - the human, the comparative and the vegetable - and that physiology resembled anatomy in being both general and descriptive. In sum, Sharpey insisted that, "Physiology is founded on Anatomy, the one useless without a knowledge of the other."(67) This was the philosophy and guiding principle that proved the strategic fulcrum of Sharpey's lectures on medicine for decades. The framework he adopted was flexible enough to accommodate changes in content necessitated by innovations in medical knowledge and techniques, but it remained at heart unaltered as a pedagogical matrix for medical teaching in the context of the university medical school.

Table 6'D' reproduces the framework Sharpey adopted for structuring his biological teaching in the late 1850s. Sharpey commenced this course with a programmatic statement of his conception of the relationship between medicine's principal sciences which differed in no

respects whatever from that he had espoused over two decades earlier. "Biology, or the science of life," he proclaimed, "is divided into two sub-sciences, Anatomy which deals with the structure of the body, and Physiology which relates to its organs and their functions."(68)

Sharpey's lectures incorporated discussion of the chemical properties of the body and some of the advanced histological researches being prosecuted at UCL's rival school at King's, but the overall structural coherence of the course was built upon a quintessentially anatomical perspective which largely excluded experimental approaches to medical science.

An important innovation occurred in 1856 when Sharpey instituted a specifically practical course in histology, and a lectureship in Practical Physiology was established "with the view of supplying the Medical Students with instruction in the use of the Microscope in examining the textures and fluids of the body."(69) Yet even this innovation entailed little more adventurous than the distribution to students of microscopic sections produced by the professors. Genuinely radical changes awaited the arrival to University College of Michael Foster a decade later.(70) Sharpey was nevertheless long the only full-time teacher of physiology in a university medical school not simultaneously engaged in medical practice or hospital work. His place in the history of medical education

cannot be assessed without reference to the physiological labours and accomplishments of students schooled under his influence at University College.(71)

Notwithstanding Sharpey's formidable reputation as a teacher, the medical department shared in UCL's general decline between the 1840s and the mid-1860s. The number of students registering for medical courses decreased from 497 in 1837-1838 to as few as 161 in 1863-1864.(72) In 1848 the 'Lancet' attributed "the ruined character" of the institution to the internecine domestic disputes which continued to plague it.(73) The sustained recovery of the late 1860s owed much, like the institution's initial meteoric rise, to the medical department.

UCL undoubtedly gave a vital impetus to higher education in the bio-medical sciences. As J.F.Clarke argued in 1874 expressing the ideology of the professional middle class who had benefited most from the institution's existence;

"<i>t is not an inopportune moment ... to remind <medical> students of the past. For many of the advantages they now possess, for many of the improvements in their education and for a destruction of a gross monopoly of place by money and patronage, they are mainly indebted to the influence of 'that low place in Gower St.', assisted by the unflinching and constant advocacy of a free and independent medical press."(74)

By this time it was becoming increasingly apparent that University College, London had achieved some success in advancing one of the explicitly-articulated

goals of the institution's founders - elevating the status of medical men among the new middle class in Victorian society.

King's College, London.

The foundation of University College, London in 1827 had aroused the wrath and indignation of Anglican Tory interests who responded to the explicit radicalism and infidelity of the Benthamite institution by establishing a rival college based no less explicitly on conservative and Anglican principles. Political and educational objectives were intertwined: King's College, London was another educational institution brought into existence as part of a wider conservative political strategy of 'dishing the whigs'.⁽⁷⁵⁾ Both the Duke of Wellington and the Chaplain to the Archbishop of Canterbury were closely involved in organising the campaign to found a second metropolitan university college that would embody the ideals and interests of social groups committed to the preservation of the established political and religious order.⁽⁷⁶⁾

Yet though KCL represented a conservative counterblast to the radical threat posed by its rival to the comfortable elitism of the Tory landed and clerical establishment, it nevertheless assumed some of the 'progressive' characteristics of its predecessor. KCL's students were able to study courses in a wide range of subjects, 'professional' and 'technical' as well as 'liberal'. By the 1840s prospective students could elect

to take courses in fields as directly 'vocational' as architecture and engineering. Most departments were staffed by professors with impressive academic credentials; and the College acquired a high reputation among social groups in sympathy with the prevailing ecclesiasticism which it fostered and sustained.(77)

Also like its rival, KCL's governing body accorded scientific and medical studies a high place in its scale of educational priorities. Benjamin Brodie, Astley Cooper and Sir Henry Hallford (all powerful spokesmen for conservatism in 'professional' medical matters) were actively involved in the establishment of King's and were members of its first official Council, ensuring strong representation for medical interests.(78)

By the mid-1830s approximately five hundred students were enrolled at each metropolitan college, about half of whom were taking medical courses.(79) At King's, however, student numbers declined to only 125 in 1840, despite lowering fees below those of its godless adversary in an abortive attempt to widen its share of the market.(80) King's remained one of the smaller medical schools after 1840, when, again following a trend inaugurated by its rival, King's College Hospital was opened to provide students with the facilities of the wards and the dead-house necessary to acquire direct experience of clinical medicine.(81)

The extent to which the institutional locus of the clinic gave rise to a mythological discourse imbuing,

venerating and sanctifying reverential awe for the truth-revealing powers of the ward and the cadaver will be examined more fully in the next chapter. It is important here to anticipate this theme because of the historic significance of the conjunction between the university medical faculty and the hospital. This potentially furnished a material base for a synthesis of the age-old clinical tradition of medical culture and the radically discrepant culture which was a distinctive ideological product of the historical transition from 'hospital' to 'experimental' or 'laboratory' medicine.

In 1851, William Bowman (1816-1892), Professor of Physiology at King's College and co-author of the most widely-used textbook in British medicine(82), counselled his students to avoid identifying medicine exclusively with knowledge of the medical sciences. He stressed that

"it would be the greatest mistake to suppose that a profound acquaintance with such sciences as Chemistry, Botany, Anatomy, Physiology, or even Pathology, and of these even in their practical aspects, <could> be sufficient to constitute you able physicians and surgeons."

Nothing could possibly achieve this objective, in Bowman's view, "but the adding to your science a close and extensive personal familiarity with the phenomena of disease, and the actual changes produced by medical interference."(83) Laborious and diligent study of clinical cases in their myriad complexity as revealed in the wards of the hospital was the sine qua non of medical education.

Practical, first-hand experience of dissection, ex hypothesi was a necessary foundation of legitimate clinical knowledge. The dissection-room thus assumed great importance as the site of doctors' profoundly symbolic rite of initiation into the profession of medicine. Bowman emphasised that true knowledge of medicine - the transmission of which to the student was the ultimate end of medical education - could be attained

"only by careful and repeated dissection; for which the best lectures, and written or pictorial descriptions, <could> furnish no substitute, however valuable and necessary as aids."(84)

Bowman summarised the central meaning of his prolegomenon to medical teaching with a terse Latin epigram - "Ex libris nemo evasit artifex", which accurately expressed the profound suspicion of the clinician for medical theories and book-medicine divorced from 'real' experience of illness and disease. Bowman insisted that only the wards of the hospital provided the student with the means to acquire a thoroughly practical knowledge of disease and, concomitantly, with the opportunity to attain the differentia specifica of his profession. For in the hospital, Bowman believed, the medical student

"<drunk> at the fountain-head of knowledge, he read the book of nature, and observe<d> for himself those processes of decay, those forms of active and chronic disease, from which his teachers <had> drawn the information they <were> imparting to him."(85)

The hospital furnished an institutional basis for a transmutation of the student's perception of disease, which ceased to be "an abstract thing" because the student

"had before his eyes the pallid countenance, he listened to the sounds, he felt the throbbings, he watched and recorded those hundred changes which were to be his own guides hereafter in daily passages of peril and anxiety ..."(86)

Bowman here conveyed a vivid portrait of the culture of clinical medicine to which KCL's medical students were initiated after the opening of the hospital in 1840.

Some years later, Lionel Beale (1828-1906), Professor of Physiology and of General and Morbid Anatomy, took the opportunity presented by the completion and opening of a large portion of a new hospital at King's to reiterate the advice of his colleague Bowman and others about the centrality of hospital studies to medical education. Neophytes were instructed that the excellent facilities of the new hospital gave them unprecedented advantages over their predecessors for serious clinical study. They would be taught how to diagnose and treat different diseases, and would be obliged to attend clinical lectures delivered by physicians and surgeons in the hospital itself.

Like Bowman, Beale strongly cautioned students against undue reliance on book medicine;

"no amount of reading or study will make up for irregular attendance or idleness in the hospital; neither will you find that the most perfect book knowledge of medicine will

form a substitute for the personal observation of cases, and for the personal investigation of symptoms, when you are called upon unassisted to treat a case of disease."(87)

Unlike many more uncompromising proselytisers for the cause of clinical medicine, however, Beale was also a vigorous advocate of the applicability of the natural sciences - physics, chemistry, physiology - to therapeutics: the medical student, in his conception, was ipso facto "a student in science."(88) Scientific clinical medicine demanded the symbiotic fusion of experimental investigation with unremitting attention to the sick at the bedside. Such was the professional advice offered to King's medical students by Beale in the mid-1850s.

KCL's Medical Faculty, though smaller than its rival, had by this time become one of the most thriving centres of medical education in the British Isles, largely on account of the courses in advanced microscopical histology and practical physiology taught there by an able professoriate which included (in addition to Bowman and Beale) Herbert Mayo (1796-1852) and Robert Bentley Todd (1809-1860).(89) These teachers still encountered the difficulties experienced in many English medical schools.

At King's the most serious impediments were two-fold. The first was the wider problem of deficient financial investment in support of scientific investigation which long stymied the emergence of a 'profession' (in the

most basic sense of remunerated employment) of physiologists and other specialist practitioners of the biological sciences in England. The second was an inexpedience that bedevilled the medical departments of both metropolitan colleges - that the generally conservative requirements of the English licensing-bodies gave no stimulus to the reform of medical education.

More particularly, the Councils responsible for framing the medical curriculum were forced to do so in conformity with the undemanding requirements of the College of Surgeons and Apothecaries' Hall.(90) Not only did this circumscribe curricular innovation; it also actively discouraged many students from attending more courses than the minimum requisite for licensing purposes. Temple Wright, a King's scholar, defined in 1867 what became known as the 'medical grievance' which threatened the University of London with a serious crisis in the late nineteenth century:

"<y>ou attend the prescribed courses of lectures and you discover that, if you are only going to take the diplomas of the Colleges of Physicians and Surgeons, you have done all that is necessary, while, if you intend to graduate in the University of London, you must read infinitely more than you learn from your lectures."(91)

Before 1854, medical graduates of either college were unable to use their degrees, including the MD, as qualifications for medical practice.(92) The Apothecaries' diploma became the object of much derision

by socially conscious and upwardly mobile doctors of the mid-Victorian period. Wright was typical in judging that "it <was> not fair that a set of tradesmen should affect to grant licences to scientific men like doctors of the present day <1867>."(93)

If some students were aggrieved at the circumstances in which medical education was conducted at King's, some of their teachers bitterly deplored them a fortiori. In a letter to his former mentor Henry Acland, Lionel Beale complained in 1866 about both organisational difficulties caused by the paucity of investment, and the deleterious consequences of conservative licensing regulations:

"<i>t seems to me that there is admirable opportunity of doing some good scientific work in connection with medicine, and I believe I have health and go in me to do something, but the utter slovenliness of the arrangements ... at the College renders progress impossible."(94)

Beale stressed that the questions and problems posed by these circumstances were "even larger than concern<ed> K<ing's> C<ollege>": they were applicable to English medicine 'tout court'. Beale's prescription for progress was "to train up towards the ideal standard and drag such bodies as the College of Surgeons after us, instead of allowing them to keep us back which is the case now."(95)

Beale recognised that the "good scientific work in connection with medicine", which he and many other contemporary biological scientists earnestly desired to

undertake on a professional basis, would not be forthcoming so long as medical examinations and curricula were geared towards licensing diplomas or framed by medical practitioners. Examiners were often surgeons whose expertise was largely restricted to surgical anatomy (excluding knowledge of recent physiological research) rather than academic scientists on the German model.(96) Beale surmounted these difficulties to the extent that King's medical school had become a flourishing department by the mid-nineteenth century.

Given the staunchly Anglican ethos of the institution and the explicit religious commitments and objectives of its founders, it is necessary to consider more fully whether the medical pedagogy at King's was in any sense influenced, conditioned or determined by such religious goal-orientations. As Kitson-Clark has observed on the subject of religion in nineteenth century England,

"probably in no other century, except the seventeenth and perhaps the twelfth, did the claims of religion occupy so large a part in the nation's life, or did men speaking in the name of religion contrive to exercise so much power."(97)

The hypothesis that KCL's medical education might bear some reciprocal relationship to the Anglican culture institutionally-fostered there appears to have some prima facie plausibility and certainly merits further examination.

The difficulty of upholding heterodox views on

religious matters at King's was discovered by Charles Lyell, famed exponent of geological uniformitarianism, who located his own work within the radical, free-thinking tradition of the 'philosophes' of the Enlightenment.(98) His contempt for Anglican bishops, the Church of England hierarchy and the authority of priests proved incompatible with his tenure of a Chair at King's, which he resigned under pressure. Justus Liebig, the brilliant German chemist, wanted to be considered for the vacant Chair at King's in 1845, but his Lutheran background made him ineligible for the appointment.(99)

By contrast, the Anglican credentials of Lionel Beale were impeccable, and his unswerving commitment to orthodox religious principles was never in doubt. Beale's professional career illustrates both the profound impact of histology on the development of medical education, and the degree to which theological commitments and an institutional ethos might structure a whole field of research acting as a matrix for scientific creativity and growth.

Beale had spent two years under the tutelage of Henry Acland at the University of Oxford where he assisted his mentor in the Herculean task of convincing the recalcitrant authorities of that august body that the study of biological science was a legitimate and necessary part of a liberal education. At Oxford, Beale developed an interest in microscopy and became

convinced of the instrument's potential as a diagnostic weapon and aid to practical medicine.

At the age of twenty-four, Beale defeated T.H.Huxley in the competition to succeed Bowman as KCL's Professor of Physiology and General and Morbid Anatomy in 1853. The conception of bio-medical science upheld by Beale (despite modifications in esoteric detail throughout his long career) represented a clearly-formulated alternative to that same rival's uncompromising physicalist and naturalistic programme for re-establishing the life sciences on a new foundation. The results of Beale's extensive histological investigations were put to a particular use - that of developing one of the most intellectually sophisticated variants of neo-vitalistic biology, in direct opposition to the cosmology of scientific naturalism. The high reputation Beale acquired as a skilful and erudite microscopist made him one of Huxley's most formidable professional adversaries.(100)

One common misconception about histology in general and Beale's histological investigations at KCL in particular, must be eliminated from the outset. This is the conventional positivist wisdom which seeks to contrast the underdeveloped and 'baneful' state of English histology during the earlier decades of the nineteenth century with the later emergence of a more mature and ultimately 'scientific' discipline which gave rise to the triumphs of cellular pathology.

Although the shortcomings of this framework of interpretation have been alluded to and criticised elsewhere in the thesis, it is important at this juncture to observe a new twist to the thrust of this orthodoxy. For here a particular (misleading) view of the dynamics of technological development serves to reinforce the over-riding assumptions of positivism. For it has been maintained that many of the supposed late nineteenth century 'conquests' of medical scientists were largely the product of technical advances in the construction and manufacture of microscopes which eliminated spherical and chromatic aberration and other serious optical defects. Such improvements supposedly enabled the percipient and perspicacious microscopist to see a more 'exact' and 'accurate' picture of the complexities of intra-cellular events and cellular reality, thereby making a 'scientific' pathology possible.(101)

This historiographical framework (which amounts to a crude technological determinism put to the service of whiggism) suggests a distorted and vastly oversimplified view of the process of growth actually assumed in these branches of biology. For technical adjustments which made the microscope a more reliable instrument only served to render more problematic the interpretation of the image of the intra-cellular universe which it revealed to the observer's eyes. As Reiser's apposite and epigrammatic formulation makes

clear, "<t>he microscope per se could not confer the power of observation upon the unlearned."(102)

Because of its dependence upon the perception, comprehension and interpretation of specifically visual images, the science of histology had to be taught within a strong pedagogic framework.(103) The perceptual resources without which the nature of cellular reality could not be made intelligible, had to be 'learned' by neophytes. Present-day psychologists and sociologists of perception emphasise in their different ways that the process of learning to 'see' a particular object in question is inextricably bound up with how the 'reality' of that object is represented as such.(104) At all stages of its historical development the science of histology was critically dependent upon prior theories, schemata and concepts which students had to be taught if they were to structure, categorise and render coherent the chaotic visual representations of cellular processes opened up by more sophisticated microscopes into their field of vision.

Beale's school of histology at King's provides a classical example of the profound complexity and theory-dependence of perceiving cellular reality. Beale adopted elaborate techniques for preparing and utilising the department's microscopes. Staining microscopic sections with chemical dyes was necessary to make the inner organisation of the relevant tissues intelligible. Different forms of chemical treatment and microscopic

strategies allowed students to differentiate between various levels of organisation manifest within the structure of the tissue. Without utilising the proper microscopical technique, the student would be denied the meaning of the images of cellular life projected through the microscope's lenses.(105)

Beale consistently upheld the view that accurate vision of biological organisms crucially hinged on the carrying out of the appropriate procedures. He maintained that progress in the field of microscopic research and the science of histology was

"in great measure dependent upon our knowledge of the various methods which experience had shown to be advantageous for rendering the anatomical peculiarities of a texture clear and distinct."(106)

Neophytes were warned that the principal object of their immediate endeavours (discerning and explaining the visual images before them) was neither obvious nor unproblematic. "The eye of the observer," Beale insisted, "require<d> much careful education before he <was> able to appreciate fully the character of the structure he <was> examining."(107)

Departing from the naive realism which identifies what the histology student saw through the microscope with the 'real' cellular structure of the tissue, it clearly becomes possible to take a much wider view of that "careful education" which Beale stressed was an important and inescapable dimension of 'seeing' cells as such.

Students were enjoined to reconcile their protean findings with the received model of cellular organisation which was the hallmark of Beale's department qua 'school' of histology.

Forbidden to rely exclusively on their own subjective observations, an index of strong pedagogic framing, students were instructed to defer to the authority of the school when it came to the critical question of interpreting the scientific meaning of microscopical revelations. Beale effectively inculcated students with a particular and selective view of the nature of cellular reality which was a product of the background assumptions, techniques and preconceptions he brought to bear on his teaching at King's.(108)

The particular form of histological knowledge (in a sense crafted and manufactured by Beale's pedagogic concerns) was developed in conscious opposition to a rival theory of life which ultimately sought to expunge the transcendental and teleological notions which had long sustained an apparently resilient vitalistic biology. The principal exponents of this rival programme (including Huxley, Tyndall, Darwin and Spencer) and the polemical purposes it promoted are the main subject of chapter eight. Here we must observe that Beale remained an outspoken vitalist who openly ridiculed the claim of physicalists and reductionists that experimentation supplied the essential key to the understanding of physiological processes. Much of the debate over

neo-vitalism in England was about different views of the explanatory adequacy of chemical approaches to intra-cellular events.(109) Beale's histological researches were marshalled to the defence of spontaneous generation or heterogenesis, and to the destruction of bacteriology and germ theory.

Beale took his basic vitalistic stance against germ theory on the view that 'disease germs' were essentially living particles of degraded 'bioplasm' whose characteristics arose from the property of 'vital' movement which could not be explained purely in physico-chemical terms.(110) The cell, ex hypothesi, comprised two complementary constituents: an actively living formative part (originally 'germinal matter' but renamed 'bioplasm' in 1872) (111); and a constellation of formed non-living parts regarded as 'dead bioplasm'. Only the former was truly alive, a veritable source of vital properties and an active agent of organic processes. The latter was simply inert matter, critically dependent on the special vital forces of the former.

The point of Beale's distinction is evident: it corresponded to the difference between the physico-chemical forces operating within the body, and the 'elan vital' which supplied the quintessential basis of life. Indeed, 'life' for Beale could not be reduced to a property, function or activity of cells alone; it subsisted at the sub-cellular level in the bioplasm, or, more accurately, in the 'sphericles' of which this

substance was composed. Only the existence and activity of the latter ultimately explained the dynamic continuity of life.(112)

The germinal matter identified by Beale was invoked as a specific example of a transcendent spiritual principle which bore witness to the prescient intentions of a divine artificer. Beale argued that germinal matter possessed a 'mysterious agency' distinct from brute matter, which could never achieve organic form independently of the vital, immaterial force vested in the bioplasm, whose operation was inherently unamenable to strictly physical modes of explanation.(113)

The content and character of Beale's courses in microscopical histology suggest that there is no necessary antithesis between advanced, technologically developed bio-medical science and a strong commitment to metaphysical and religio-philosophical goals.(114)

Beale's consistent espousal of a view of life which gave priority to the ineffable irreducibility of vital phenomena and their recalcitrant resistance to physico-chemical formulation, was compatible with, and gave sanction to, the religious ends King's College was established to promote. His histological researches were expressly undertaken to help the medical student, (as Beale himself reflected at the end of the nineteenth century, more convinced than ever as to the correctness of his long-standing philosophical and religious convictions) "to see through physico-chemical, agnostic,

anti-biological vagaries."(115) Beale's microscopic studies gave expression to his belief in a specific causa vitae which reserved a central place for the agency of God. The view of life according to the cosmology of natural theology was reinforced, stamped with the normative authority of 'science'.

The metaphysical and religious goal-orientations which structured Beale's scientific pedagogy were thrown into sharper relief when, from about the 1860s, the whole tradition of microscopic research as conceived by Beale became subjected to the mounting polemical assault of a self-styled vanguard of life-scientists committed to physicalism, experimentalism and reductionism. Even a religiously-oriented institution like King's accommodated members of this 'progressive' group on its teaching staff. From 1869, William Rutherford (1839-1899) gave a course in practical histology at King's largely modelled on the example of John Hughes Bennett's teaching at the University of Edinburgh.(116) The assumptions, methods, techniques and preconceptions embodied in Rutherford's pedagogy did not resonate well with the institutionally-sanctioned ecclesiasticism at King's.

In 1869 Rutherford referred in his introductory lecture at the start of the new session to Beale's predecessors at King's, Todd and Bowman. Whilst deferring to their 'deserved reputation' for having written one of the most widely-used textbooks of the

early Victorian period, Rutherford self-consciously distanced himself from their tradition of bio-medical research. The leading motif of Todd and Bowman's "Physiological Anatomy and the Physiology of Man" was the insistence that "a thorough training in anatomy" was necessary for "a correct appreciation of physiological science."(117)

Beale's histological studies perhaps represented the culmination of this research problematic of anatomical physiology. From Rutherford's perspective, this peculiarly English tradition of bio-medical investigation was, if not dead, moribund and doomed to extinction. Even as Beale continued to teach within his established pedagogic framework, Rutherford informed King's medical students that

"although the future progress of microscopic research doubtless depend<ed> not a little upon improvements which <would> be effective in the construction of the instrument, it <had> for some years been evident to all that histology now wait<ed> on physiological chemistry."(118)

The principal desideratum, in Rutherford's view, was to ascertain "new modes of acting chemically upon the tissues ere we subject them to microscopic observation."(119) Beale's research problematic and its correlative theological concomitants stood condemned, and histology rudely dismissed, in Huxley's notorious formulation, as a "science of yesterday."(120)

In response to this growing chorus of criticism, orchestrated by Huxley's circle and other progressives,

Beale sustained his vitalistic crusade against the protoplasmic theory of life and germ theory. Beale defended both the authentic tradition of microscopic research and the 'scientific' integrity of natural theology's view of life against experimentalist opponents who condescendingly sought to impugn and belittle the histological work to which he had dedicated his life.

At times of serious controversy between rival communities of scientists, frequently preceding and partly determining paradigm-shifts(121), the role of wider interests and forces in structuring a field of research or sustaining a particular tradition of scientific pedagogy is often more recoverable by the historian than during the span of 'normal' science.

It was perhaps one of Beale's most embittered professional adversaries, an intimate of Huxley's circle, who saw most clearly the institutionally-promoted goals underpinning Beale's programme of histological research. John Tyndall, outspoken critic of all hieratic authority, lambasted Beale for his long-standing opposition to the substantialist view of life, as a mere "microscopist, ignorant alike of philosophy and biology."(122) Beale's insistent vitalistic stance on the principal questions of life science was, in Tyndall's view, utterly predictable from one who taught in a College "famous for its orthodoxy."(123) Equally predictable was Beale's instruction to students to look

on the tissues of the body as "the most perfect of the Creator's works."(124)

It is difficult to determine the precise extent to which medical students were receptive to the theological glosses which were, in effect, an implicit or 'hidden' curriculum communicated as a pedagogical subscript in Beale's classes. Temple-Wright, who published a book about his experiences as a medical student at King's, was sceptical about their religious proclivities. "As for theology," he averred,

"most medical students are quite content with what their mothers taught them at their knees when they were learning the Church catechism: they have no taste for controversy, as it leads to nothing but odium theologicum."(125)

Another King's student who kept and later published a diary recording his youthful observations was also impressed by the apparent agnosticism of his student contemporaries. S.T.Taylor noted that theological lectures were

"somehow or other not much appreciated by the medical students, probably because they seem to have little or no relation to medicine and surgery, so that attendance at them appears to them a waste of time."(126)

Taylor subsequently observed that the College chaplain utterly condemned Darwin's "Origin of Species", but appeared indifferent to the outcome of controversies over the evolution of life.(127)

Others were more sympathetic to the religious ethos of the institution in general, and the underlying

theological concerns of Beale's histology classes in particular. John Martin Hyde published in 1854 an article entitled "On the Reparation of the Tissues after Injury and Disease".(128) Hyde won the King's Medical Society's prize of that year for this essay, whose histological themes were wholly compatible with the sophisticated natural theology espoused and taught by Lionel Beale.

Hyde commenced by alluding to past variants of explanation of the power to repair disease which were broadly consistent with the premises of vitalistic biology - the archaeus of Van Helmont, the anima of Stahl, and the vis medicatrix naturae of Cullen. Hyde conceded that these explanations were deficient because they posited "something distinct from the ordinary attributes of the living body."(129) He contended that the true nature of the awesome property of reparation

"seem(ed) to be portion of and identical with the force which is at work during the evolution and maintenance of the body, in converting into organic structure matter derived from the circulation, and which has been rendered organisable by the process of assimilation; for we find that the reparative material effused into a breach of structure is developed in the same way as the tissue, into which it has to be perfected, was developed in embryonic life."(130)

The end-result of Hyde's discourse on medical histology was to re-establish and reaffirm - both by updating the more outmoded tenets of natural theology and giving 'scientific' sanction to what remained to be

discredited of teleological biology - the existence of "an intelligent Author and Governor." If the power of healing and reparation was no longer 'mysterious' on account of advanced histological researches, it nevertheless remained 'wonderful' and confirmed

"what we have previously learned from reasoning, from the analogy of Nature, and from revealed religion, regarding the existence of an Almighty Being, at once Creator and Conservator."

Hyde withdrew from upholding the doctrine that processes of reparation were the direct product of a deliberate act of interference on the part of the Deity, but insisted that they functioned "in conformity with a general fixed plan of operations which has for its origin His will." (131)

Both the substance and the intellectual tenor of Hyde's essay resonated emphatically with the ecclesiastical orientation and religious ethos of King's College as a deliberate counterblast to the 'infidel' influence of its rival, University College. We have seen how such 'extra-scientific' institutional imperatives left their mark on the medical faculties, education and pedagogy of these different university colleges.

CHAPTER SEVEN

THE HOSPITAL 'WARD': EDUCATION IN CLINICAL MEDICINE.

"Clinical Medicine, though a special department of knowledge, is so intimately connected with other sciences that, when the claims of these are satisfied, it might seem that nothing would remain to it. This appears to me the present error of our schools. It would not, however, be too much to assert that, were it possible to enjoin in one human intelligence all that is now known of other sciences, such knowledge would be compatible with entire ignorance of the department of clinical medicine. As the physiologist must yet assert, that the phaenomena of living tissues are not explained by their chemical composition, or, as the chemist himself has equally to admit, that mere isomerism may be no clue to chemical qualities, so the clinical physician knows that the phenomena of disease are not explained by the knowledge of healthy textures, nor by the action of healthy organs. Clinical work is a work by itself; and yet, if I may use the comparison, only so far by itself as one form of organic life may be considered separate from another. It stands apart, but has the most intimate relations to all that surrounds it. It is elucidated by the light of physics, chemistry and physiology, yet it is not comprehended by them as they now stand. In ages gone by, Hippocrates had to vindicate the study of disease from the inroads of superstition; at the present day we have to guard it against assaults on the side of science, and need to watch lest we betray it by accepting a too chemical or physical limit to our thoughts." Dr. William Gull.(1)

William Gull, perhaps the leading clinician of mid-Victorian England, here eloquently articulated the differentia specifica of 'clinical' as opposed to 'scientific' medicine. Earlier in the thesis we have examined the quintessentially clinical culture of medicine vividly portrayed in the 'oeuvres' of French philosopher Michel Foucault and other quasi-structuralist authors such

as Georges Canguilhem. We have also suggested that the deceptively obvious and elusive question 'what is medicine?' cannot be answered in purely 'scientific' terms. For medicine is not an unambiguously scientific discipline - or congeries of scientific disciplines - shaped and formed by fixed, permanent and innate forces; it is rather influenced and directed by complex cultural forces dominant in specific historical periods.(2) As cultural forces change their complexion - often as a result of shifts in the social distribution of wealth and power - so too does medicine evolve though seldom, of course, in a unilinear direction or as a purely epiphenomenal reflex to prior social change.

In this section of the thesis I shall put more historical flesh on the bones of the structuralists' conception of clinical medicine, and examine whether the development of the English hospital movement conformed to or diverged from the trajectory of change assumed by French clinics after the revolution. In accordance with the viewpoint that medicine is not autonomous but subject to operative cultural forces, I shall highlight the cultural dimensions of clinical medicine as espoused by its most irascible protagonists - teachers of clinical surgery or pathology.

Introductory addresses to medical students at the start of annual sessions gave teachers an opportunity to expound their aims and objectives and thus pass on to a new generation of doctors their overall philosophy of

medicine. These prolegomena to medical education hence afford insightful evidence of the goal-orientations of clinical teachers and therefore of the constitutive elements of clinical culture. The polemical discourse enshrined in the documents cannot be read as autonomous forms of talk which speak for themselves independently of time and place. They demand contextualist historicisation if their significance is to be grasped.(3) Clinical teachers' polemical discourse must be properly situated in relation to the institutional setting of London hospital schools, the professional objectives of the polemicists, the intellectual characteristics of medical knowledge and the wider social context.

On the most important issues it will become clear that London's clinical teachers, if not unanimous, held much in common - a function of their similar occupational identities, common interests and ideology. However, the insights gleaned from this polemical discourse into the apparently pervasive clinical culture and clinical gaze is only a prelude to a wider project of demonstrating how deeply divided was medical culture. In the next chapter the equally polemical discourse of clinicians' perceived adversaries - those who fought to professionalise medicine on the bedrock of experimental science and looked to the laboratory for legitimation - will be examined in order to demonstrate the historical importance of antithetical tensions between experimental

scientists and clinical pathologists whose overall medical philosophy was an expression of allegiance to different ends of the antipodean cultural poles of the 'word' and the 'ward' respectively.

We have already seen that some hospitals for the sick poor had been founded in London during the eighteenth century. Only three of these institutions - St.Bartholomew's, the United Hospitals (St.Thomas's and Guy's) and the London - had a medical school attached and regarded education as a legitimate function of a hospital. By 1858, a further eight metropolitan hospitals with medical schools had been established - Charing Cross, St.George's, King's College, University College, the Middlesex, the Royal Free, St.Mary's and the Westminster.(4)

The 1820s and the 1830s were the critical decades of transition in the history of English hospital medical education, for this was the period when Boards of Governors assumed some collective responsibility for the provision of facilities and the organisation of courses for students. Hitherto hospitals had discharged a variety of functions such as the charitable care of the sick poor, the promotion of new methods of medical treatment, and the moral regulation of patients. Provision of systematic medical and surgical education was emphatically not the primary function before the nineteenth century. Training pupils was a perquisite of office rather than a duty which hospital governors were

obliged to discharge.(5) Lay governors recognised the advantages and esteem which the organisation of training might confer on the hospital; but from the 1820s onwards it was medical men themselves who increasingly provided the impetus to extend the hospital movement. Charing Cross and St.Mary's Hospitals owed their origin primarily to the initiative of doctors whose main concern was with the educational possibilities of a teaching hospital.(6)

Just how vast and revolutionary these educational possibilities might be, was dramatically revealed in Paris during the early nineteenth century.(7) For Paris became the epicentre of a revolution which inaugurated a new mode of medical production based on the hospital (as distinct from its predecessors 'library' and 'bedside' medicine, and its successor 'laboratory' medicine).(8) The hospital mode of medical production celebrated, in acute form, the interests and ideology of hospital clinicians. We must turn to the birth of the new medicine in early nineteenth century Paris to grasp the constituents of modern clinical culture.

France and the Birth of the Clinic.

Few historians have doubted that the French Revolution and its aftermath was accompanied by large-scale, far-reaching and profound changes in the institutional framework and conceptual fabric of French medicine.(9) Underpinning the fundamental transformation was a series of social structural developments - the

breakdown of rigid social and intellectual barriers between medicine and surgery; the increasing pace of urbanisation and population growth; the central government's reorganisation of the institutions of medical education; and the existence of sufficient resources to develop an effective municipal hospital system in Paris.(10)

By 1830, Paris possessed more than thirty hospitals with the combined capacity to accommodate over twenty thousand patients and provide instruction for approximately five thousand medical students. The Hotel Dieu, the oldest hospital in Europe(11), itself housed over one thousand patients in its wards.(12) Teaching at Paris hospitals often took place at an almost superhuman rate, such was the scope and variety of the 'interesting cases' presented to medical teachers. One of the leaders of the Paris School, Jean Baptiste Bouillaud, once boasted of seeing more than twenty five thousand cases in five years.(13)

The city's provision of superior facilities for clinical teaching and research induced aspiring doctors from many countries to pay professional homage. American students' predilections sometimes registered, like a barometer, the changing complexion of medical education in a world context. Many transformed their allegiance, from about 1812 onwards, away from Britain (notably Edinburgh) to the French capital. British medical men too (like Astley Cooper, Thomas Hodgkin, William Bowman,

William Walshe and John Hughes Bennett) also flocked to Paris, tacitly acknowledging that Britain's supremacy had crossed the Channel and found a new French home.(14) France has customarily been regarded as the pioneering country in the development of modern clinical medicine.(15)

'External' political factors and 'internal' changes in the social organisation of medical training combined to effect France's world supremacy as a centre of medical (and most emphatically clinical) education. The neoteric clinical school of the early nineteenth century would not have come into existence without the powerful forces unleashed by the complex of social, economic and political transformations of the French Revolution: for these forces effected a far-reaching mutation in the organisational framework within which doctors underwent their professional training.(16)

The old universities, academies and other traditional educational institutions were casualties of the revolutionary ardour of the Jacobins during the radical republican phase of the revolution. The new political authorities reconstructed and rebuilt the educational system de novo. The historic opening in 1794 of l'Ecole de Sante was a central feature of this revolutionary conjuncture: it symbolised at once an obsequial ritual for the medicine of the 'ancien regime' and a harbinger of a new medical epoch.(17)

Yet in one critical respect the metaphor of mutation

and the language of radical discontinuity commonly encountered in historical discourse on French medicine during this period have obscured a vital element of continuity between the medicine of the old and the new regime. For the post-revolutionary vitality of French clinical medicine, however vigorously promoted by administrative and organisational reforms co-ordinated by a new centrally-financed bureaucracy(18), clearly bore the imprint of the practical, professional and political developments associated with the history of French surgery during the eighteenth century.

The events of 1794, whereby the teaching of medicine and surgery were fused into a genuine symbiotic and organic unity, assume monumental importance in the historiography of French medicine; but rather differently than conventionally understood. The unification did not simply symbolise the demise of French medical traditionalism and the phoenix-like meteoric rise of a new-fangled medical science sharply distinguished from its predecessor. Neither can the unification be adequately explained purely in terms of a reform in the social and institutional structure of French medicine; for it was accompanied by a discernible shift in the cognitive and epistemological status attributed to medical knowledge to the extent that 'anatamo-clinical medicine' (shaped by a synthesis of the surgical-anatomical perspective on disease and the clinical knowledge newly-revealed in the wards of the

hospital) came to be regarded as the necessary and indispensable foundation for the education and training of doctors.

As Gelfand has argued in a penetrating study of French medicine during this period;

"<s>ocial and institutional reorganisation of the profession was the fundamental innovation that provided the context within which new kinds of knowledge could be received and diffused."(19)

The social fusion of higher elite surgeons and physicians presaged wide-ranging accord on the legitimacy and instrumental value of certain kinds of knowledge and techniques which enabled doctors to combat disease in a collectively-sanctioned 'professional' way.

What were the defining characteristics of the new anatomo-clinical medicine, its techniques and methodologies, the attitudes and values of those who practised it, and the culture it spawned? First, as a consequence of the cross-fertilisation of physic and surgery, the medicine of the Paris Clinical School was built upon a surgical 'anatomical' perspective towards the nature of internal disease conceived as a structural phenomenon.(20)

In eighteenth century Padua, Giovanni Battista Morgagni (1682-1771) had argued that the serious physician could no longer afford to ignore and hold aloof from surgical knowledge and techniques. In many ways prefiguring the interests of the French Clinical School, Morgagni's 'De Sedibus'(21) of 1761 aimed at

systematic correlation of pathological conditions with the morphological changes at post-mortem investigations.(22) What one scholar has incisively described as Morgagni's "untheoretical and unspeculative iatromechanism"(23) was predicated on acceptance of a surgically-rooted structural perspective on disease. Most French clinicians certainly shared Morgagni's scepticism about speculative medical theories divorced from tangible evidence of disease (as starkly revealed by the lesions discovered on the autopsy tables). Even the diligent observation of manifold symptoms was denigrated as an unreliable aid to diagnosis: hence Bichat's resounding pronouncement that "<s>everal autopsies <would> give you more light than twenty years of observation of symptoms."(24) Complementing French clinicians' preoccupation with accurate diagnosis of pathological states (made possible by collective acceptance of the principle of anatomical localisation) was a heightened sense of the importance of anatomical dissection as a profoundly symbolic rite of initiation into the mores of the profession and the practical foundation of every student's training in clinical medicine.

Related to French clinicians' reverence for the truths of pathological anatomy was a second characteristic emphasis of the school - on the centrality of physical diagnosis as opposed to the mere observation of symptoms. Eighteenth century diagnostics

typically entailed listening to patients' verbal statements of their subjective experience of illness; observing their general demeanour; and perhaps examining their urine or faeces for evidence of pathology.(25)

Explicit physical examination or probing the innermost recesses of the patient's body was relatively rare in the eighteenth century, particularly on the part of physicians whose elevated self-conceptions as cultured gentlemen precluded anything so vulgar as interference with the bodies of their predominantly upper-class patients. As the Clinical School's philosophy incorporated elements handed down from eighteenth century surgeons, such moral and professional taboos no longer retained their earlier force: their breakdown heralded a major transformation in the relationship typically encountered between doctor and patient, professional and client.(26)

A new conception of disease as a specific clinical entity and the body as an amalgam of localised, structural and anatomic constituents - conceptions themselves historically rooted in the institutional and political unification of physic and surgery in 1794 - produced a wider range of diagnostic techniques, including palpation, percussion and auscultation. Where the archetypal nosologies of the eighteenth century utilised evidence taken from patients' clinical histories, their symptoms and their external appearances, French anatomo-clinical diagnostics

typically incorporated information gathered not just from inspection of the surface of the body but from deliberate probing, by hand or with surgical instruments, of bodily wounds and orifices.

Francois Pipelet (1722-1809), one of the foremost Parisian surgeons specialising in the treatment of hernias, justified his adoption of the technique of palpation by insisting that observations derived from it demonstrated "how essential it <was> to examine the entire extent of the abdomen carefully when equivocal signs having a relationship to other diseases <were> encountered." (27) Only Pipelet's utilisation of that particular clinical method enabled him to proffer an accurate diagnosis of stomach hernia as the underlying pathological condition responsible for symptoms as diverse as headaches, indigestion, stomach pain and vomiting. He claimed that his experience vindicated the central position to which many French clinicians had elevated physical diagnosis.

The third characteristic element of the French Clinical School's approach was systematic utilisation of the analytical tool of statistics. A measure of agreement on the medical relevance of the procedure of systematic statistical correlation was an integral component of "the new consensus on cognitive matters" achieved by the Parisian hospital school. (28) P. Louis, the most ardent champion of the numerical method, sought to elevate the role of systematic statistical analysis

of clinical facts disclosed at post-mortem examinations into a central strand of a broader medical philosophy profoundly sceptical of the value of theory, radically empiricist in temper, and sympathetic to sensationalist epistemology - in short, an anti-philosophical medical philosophy which foreshadowed the classical statement of medical positivism to be enunciated in the mid-nineteenth century by Claude Bernard.(29) The thrust of Louis' programme for clinical medicine - an attempt to appropriate and develop the methodus medendi formulated more than a century earlier by Thomas Sydenham - was conveyed by his apophthegmatic contention that "<t>rue science <was> but a summary of facts <which were> of no value if they <were> not enumerated."(30)

The critical role of the hospital in modern medicine thus followed from its institutional accommodation of the three pillars of the new clinical medicine - autopsy, physical examination of the patient, and statistical analysis.(31) The emergence of the modern hospital facilitated the crystallisation of a distinctively 'clinical' culture invoked by T.C.E.Eduard Auber in 1839.

His "Traite de Philosophie Medicale" self-consciously appealed to the numinous authority of Hippocrates whose salutiferous wisdom enshrined in the 'Hippocratic' corpus remained apodictic notwithstanding his relatively rudimentary grasp of the 'scientific' method. Auber espoused a critical tenet of the clinical

philosophy in his contention that advances in the treatment of the sick had primarily resulted from medical empiricism rather than speculation concerning the exact causation of diseases or logical inference from scientific principles.(32) Advances in the bio-medical sciences had not, according to Auber, been translated into medicine's ultimate 'fruit', by which he meant demonstrably successful therapeutic intervention in sickness and disease. Medical education, he insisted, was literally meaningless outside the wards of the hospital or closed off from immediate contact with the sick. Auber respected clinical study alone and poured scorn on the pursuit of scientific knowledge for its own sake. Medicine must ever rest, he concluded, on its own autonomous clinical data and would advance by proceeding in Hippocratic fashion so that medical theory (indistinguishable from an accurate clinical pathology) would derive from the observation of life itself in a healthy or diseased condition rather than from the prescriptions of specific physiological or chemical sciences.(33) Auber's medical philosophy betrayed his systematic clinical training and absorption into the apparently pervasive ethos of the clinical gaze.

England and The Birth of the Clinic: A Comparative Analysis.

In refocussing attention on clinical education in English hospital medical schools we must consider the similarities between the culture and pedagogy of the

French and English clinics (stemming from emulation of the French model) and the differences (a function of the specific socio-economic and political circumstances of each nation-state).

Few commentators on English clinical education failed to draw contrasts with that of her traditional enemy. The editors of the 'Lancet' drew an invidious comparison in 1827 between the abundant facilities available for clinical education in Paris, and the disorganised, poorly-financed, inefficient and chaotic training typically available to the prospective student in London. Most uncompromising criticism was reserved for the practice of 'walking the wards' of the hospital: inadequate facilities, an absence of method and senseless regulations rendered this form of clinical instruction 'a farce'.(34) Critics further charged that clinical surgery, clinical medicine, forensic and state medicine - the very subjects which formed the bedrock of medical education in France - were almost entirely neglected in England. Many believed the critical factor in French superiority was the efficient system of public examinations which verified the ability and professional competence of every practitioner.(35)

In November of the same year, the editors expressed outrage at the injustices perpetuated by the powers-that-be in the system of English medical education:

"<1>et a student present himself for

examination, who has derived his knowledge from Dupuytren at Paris ... and he will be at once rejected; but let a candidate show that he has served for five years behind the counter of the meanest apothecary and farrier that ever drugged a man or horse, in the obscurest hamlet of the kingdom, and let him produce certificates of his having attended the lectures of certain privileged teachers for a few months, after the expiration of these five years of druggery, and he will be let loose to practise on the health and lives of the king's subjects."(36)

Such pronouncements expressed the interests of aspiring general practitioners and served the expressly polemical purpose of posing the question 'quis custodiet ipsos custodes?' in the context of contemporary politics of English medical education. The Lancet's rhetoric is an index of the degree to which self-styled 'progressives' in medical politics used the example of French clinical education to bolster the campaign to expose abuses in London's hospital schools.(37)

English medical reformers underlined how governmental financial and administrative support determined the character and quality of each nation's clinical teaching. The most striking difference was simply quantitative. Where patients in Paris hospitals increased from thirty thousand to more than fifty thousand in the first three decades of the nineteenth century, all Britain's hospitals housed only three thousand patients in 1800, rising to less than eight thousand as late as 1851.(38) The statistical variation was largely a product of the different basis of

ownership and control in each nation. Centralised ownership in France facilitated the rapid expansion of the hospital system; English hospitals were privately financed and remained strictly eleemosynary throughout this period.

The history of medical education in England has no analogue of the French unification of physic and surgery of 1794, but the imprint of the specifically surgical perspective on disease has great bearing on the clinical education of England's hospital medical schools. In the eighteenth century, hospital teaching was mainly given by surgeons for apprentice-surgeons; medical, as opposed to surgical, teaching was provided for the benefit of apprentice-apothecaries on a short-term basis. Physic remained long underdeveloped in relation to hospital education. At Guy's Hospital for much of the eighteenth century, only one physician was responsible for lecturing on medicine, chemistry and materia medica, in addition to performance of routine hospital duties.(39)

Given the strength of surgical vested interests, change in this state of affairs was slow to materialise. When James Copland came to the metropolis from Edinburgh in 1815 to commence his studies he found relatively little on the medical side of his education at London hospital schools, but a great deal on the surgical.(40) For most of the first half of the nineteenth century, medicine remained much less integrated into the structure of the metropolitan hospital system than did

surgery.(41)

Before 1858, the curriculum at the London hospital schools was inchoate, unstructured and predominantly anatomo-chirurgical in character. The Apothecaries Act of 1815 made it obligatory for candidates seeking the LSA to undertake courses of instruction in anatomy, physiology, chemistry, materia medica, and theory and practice of medicine, and to attend six months' hospital practice. Similarly, the RCS stipulated two separate courses of anatomy, including lectures and demonstrations together with one full year of hospital practice, for MRCS candidates.(42) Standards were not rigorously enforced and, in practice, how the student spent his five-year training periods was largely left to his own discretion.

Before courses and examinations became more standardised later in the nineteenth century, students received heterogeneous forms of training to extremely variable standards even within the metropolis.(43) Students attending different hospital schools did not receive common instruction; many had difficulty deciding which courses to attend in a complex and confusing market - especially before the insurmountable decline of the proprietary schools as the hospital movement gathered momentum.(44)

Even the mundane licensing requirements specified by the medical corporations permitted some expansion of the curriculum. Table 7'A' gives a schematic outline of

curricular growth (the minimum required for general practice) during the forty years after the Apothecaries Act. Table 7'B' expands on the bare picture and gives a fuller idea of the diversity of courses open to metropolitan students in pursuit of their professional qualifications. Before the 1820s, when hospital teaching was almost entirely a matter for individual members of staff, the content of the curriculum was more arbitrary. The trend to a more formalised and extensive curriculum in the London hospital schools was the result of a more corporate approach to hospital organisation rather than a direct product of educational stipulations embodied in the Apothecaries Act.(45) Another important consequence of the trend towards corporatism was that pupils became the responsibility of the hospital rather than individual teachers. The latter's formal de iure powers to determine the curriculum were reduced, paradoxically at the same time as their de facto powers were increased by the progressive inability of lay governors to maintain an understanding of the technical minutiae of medical science.(46)

In the long-term, the most far-reaching and momentous changes in English medical education stemmed less from the mushrooming of specific disciplines on the curriculum than from the revolution in techniques associated with new diagnostics no longer based on simple observation and classification of symptom-complexes, but on examination of physical signs elicited

on the patient's body whose pathology might subsequently acquire empirical confirmation in the lesions found at autopsy. In short, we refer to the transmogrification in medical perception produced by the transition from 'nosological' to 'anatomy-clinical' medicine.(47)

New techniques embodied in the systematic attempt to correlate the tangible results of morbid anatomy (the new science 'par excellence') with the physical signs exhibited by the living patient have been described as constitutive of "the most remarkable change in medical education between 1800 and 1858, and, for that matter, between 1500 and 1858."(48) Instructing students, through heuristic modes of pedagogy, in clinical methods, diagnostic techniques and therapeutics became the major preoccupation of most hospital teachers after about 1830. The uncompromisingly practical emphasis of hospital pedagogy betrayed its origins in the growing acceptance of the 'surgical' anatomical perspective. Just as the clinical character of the medicine taught at the Paris School owed much to the influx to medicine of personnel trained first and foremost as surgeons(49), so the distinctive character of clinical education in London schools reflected the vigour of surgical traditions. Throughout the nineteenth century, many hospital teachers continued to defend the value to medicine of the Hunterian legacy.(50)

The critical structural role of the surgical 'mentalite' and surgical labour in socially shaping the

ethos of the new clinical medicine is suggested in a further way. The performance of autopsy was not per se a novel phenomenon, having been performed frequently during the seventeenth and eighteenth centuries in various parts of Europe. Autopsy's innovative and radically instrumental position as a pillar and fundamental prop of anatomo-clinical medicine derived from surgeons' recognition of the need to unite post-mortem enquiry with physical diagnosis. In abstraction from the latter the ultimate medical significance of autopsy remained implicit and circumscribed.

Tumours and abscesses probed by the surgeon's dissection-knife prompted investigation of the correlations between such internal revelations and the physical signs legible on the external surfaces of the body. The result was a profound reorientation of pathology. As validly formulated by one scholar:

"<the> surgical perspective on internal disease, being necessarily structural and manipulative, is likely to accord primary relevance to both pathological anatomy and physical diagnosis together. In this cognitive framework, pathological and physical diagnosis may be seen as joint expressions of a single tenet of pathology - namely that the disease process is somehow associated with perceivable structural change."(51)

If this "triangular fructification"(52) between surgery, pathological anatomy and physical diagnosis underpinned the flowering of medicine in early eighteenth century Northern Italy (notably in Padua), and in late

eighteenth century France (notably in Paris), a similar fructification provided the structural basis for English clinical medicine (notably in London) in the 1820s and 1830s.

One of the most profound socio-medical ramifications of the new-found importance attributed to physical diagnosis rather than the observation of symptoms was a transformation of the relationship between professional and client. As in Paris so in London, the clinic furnished an institutional setting in which a qualitatively different and hitherto unprecedented type of relationship between doctor and patient emerged. In the eighteenth century, the network of interaction between the doctor and his patients reflected the predominant influence and power of the client (typically a wealthy and status-conscious member of the Georgian gentry) in the consultative relationship. As the patronage system customarily operated during the earlier period, the client's position within the graded hierarchy of English society gave him the power to define not only his own medical needs, but also the manner in which they would be met.(53)

Large numbers of plebeian patients passing through the wards of hospitals like the Charite at Paris, the Allgemeine Krankenhaus at Vienna, or St.Bartholemew's at London engineered a remarkable transmutation in the social dynamics of the doctor-patient relationship - a stage in a long-term shift from a 'person-' to an

'object-orientated' medical cosmology.(54)

David Nelson, a clinical teacher at Queen's Hospital, Birmingham, conducted a class in clinical diagnosis in 1849. He reminded students of their ethical obligations to promote the welfare patients, but nevertheless insisted that

"in endeavouring to arrive at the correct conclusion, it <was> of very great importance that <they> rather trust<ed> to physical or other signs that <could> be brought under <their> actual observation, than to the statements of patients which <were> often liable to be erroneous from the influence of hypochondria, or from the variable temper which characterise<d> sundry diseases and also from premeditated deceit."(55)

Students were informed that the chief requisite of a sound physician was the capacity of arriving at a correct diagnosis of disease; and that judgements on the condition of living bodies could only be confirmed on the basis of post-mortem examinations.(56)

In the same year William Walshe, Professor of Clinical Medicine at University College Hospital, gave expression to a similar conception of the patient's subjective experience of illness. In a lecture on clinical medicine, Walshe instructed his students that

"<p>atients ... <would> ever be ready to obtrude the prevailing 'popular notions' as to the causes and conditions of their disease, rather than to state what they themselves <had> actually noticed and experienced. <I>n medicine, popular notions <were> certainly not to be revered; in medicine, of a surety, 'vox populi' <was> not synonymous with 'vox Dei'."(57)

Medical students were explicitly enjoined to be

sceptical about patients' own self-understandings of their pathology. "Accept no assertions from your patients," Walshe warned, "without endeavouring to obtain proofs of their justness." In the absence of any such empirical corroboration, students were strongly advised to regard patients' statements as "valueless and unfit to take <their> place as an element in any statistical enquiry."

As to the basis on which accurate clinical diagnosis might proceed, Walshe was in fundamental agreement with Nelson in counselling his students to

"e minute in <their> detail of signs and symptoms: be minute whether <they> regard<ed> a case as a single and solitary one or as one of a series. The value of closeness of observation <was> perpetually displayed at the bedside."(58)

Both Nelson and Walshe gave expression to a particular view of the meaning and object of clinical diagnosis - a view which gave priority to the physical examination of observable organic structures rather than to verbal analysis of patients' subjectively experienced and defined sensations and feelings.

The lowly social origins of many patients in urban hospitals (during a period of heightened class awareness and acute class antagonisms) may have given added shape to, and concretised, the new form of relationship between doctor and patient. In the early nineteenth century, what Elias has referred to in a germinal treatise of historical sociology as 'the civilising

process' remained at an embryonic level of development: it was not unusual for some elements among the lower orders to urinate, defecate and copulate quite openly, publicly and unselfconsciously in the ordinary course of their daily lives.(59) The perception of this behaviour on the part of the nascent working class (including many among urban hospital patients) by upwardly-mobile social groups (including doctors) as plebeian, proletarian and 'uncivilised', clearly impinged upon the historical process whereby the relationship between doctors and their patients became redefined in the transition to 'hospital' medicine in England.

It is reasonable to assume that wider processes of social change (integrally bound up with the overall historical development of the first industrial nation) operated to increase the social distance between doctor and patient, rendering the latter a dependent and submissive bearer of 'interesting' diseases, instrumental to the advance of medical education and science. The typical hospital patient was not in a favourable structural position to offer effective resistance to the new modes of treatment, or, therefore, to challenge or subvert the more inegalitarian and formalised relationship taking shape.(60)

The 'therapeutic nihilism' for which critics attacked and berated the clinical school was perhaps the ultimate index of the devaluing of the interests of the patient. Opponents charged that the end of medicine - the cure of

illness and disease through the utilisation of demonstrably successful and efficacious therapeutic methods of intervention - was being sacrificed to the formulation of diagnostics and an unproductive obsession with pathology based on the correlation of ante-mortem symptoms with local lesions discovered after death.(61)

In France, where this debate originated, Francois Broussais (1772-1832) lambasted Rene Laennec (1781-1826) for his lack of concern with patients and indifference to curing them. Broussais' principal singular target was the nosological school of Pinel, but he extended and generalised the charge to the effect that Pinel, Laennec and their doctrinal sympathisers were all far more favourably disposed to the performance than the prevention of autopsies. To the predominant clinical pathology, Broussais counterposed a radically dynamic physiological medicine rooted in life-processes and sceptical of the ontological status of disease entities. The emphasis on French clinicians' supposed indifference to the production of effective therapeutics cannot be accepted at its prima facie value, in isolation from its evaluation as such in a particular polemical context. Insofar as 'therapeutic nihilism' retains any plausibility as a characterisation of French clinical medicine of the early nineteenth century, it is best regarded as a deep register of the seismic shift that relocated the physician rather than the patient as the dominant partner in the consultative relationship.(62)

The hospital mode of medical production, therefore, and the clinical education to which it gave rise was born in the hospitals of Paris during the French Revolution, and matured in its aftermath. We must now consider whether, and when, it makes historical sense to speak of the advent of hospital medicine (and the hegemony of clinicians over the technical production of medical knowledge) in England.

Undoubtedly, Foucault's metaphor of mutation is far too stark to be applied with any accuracy or precision to English experience. The slow, gradual, piecemeal and unsystematic development of hospital medical education in London was a typical piece of English 'ad hoc'-ery. This reflected the atomistic structure of hospital organisation and the absence of that systematic governmental support which made the French medical profession the envy of the world. In England, the resilience and tenacity of 'laissez-faire' in medical matters induced doctors to court the treacherous assistance of grave-robbers and resurrection-men in an attempt to overcome the serious educational problems created by the chronic shortage of cadavers for anatomical dissection.(63)

So inchoate, ill-defined and amorphous was the way hospital teaching took root in London that it is misleading to imply the existence of a recognisable clinical 'school' before the 1830s. The viability of this periodisation is confirmed by Newman's observation,

based on evidence of ward case-notes at Guy's Hospital, that this decade witnessed the first significant references to clinical techniques such as auscultation and the elicitation of physical signs on patients' bodies.(64) This evidence suggests that from the 1830s the distinctive hallmarks of the new clinical medicine defined the context in which the London medical student underwent his professional training. Innovations were introduced gradually, but represented the genuinely radical changes historians such as Ackerknecht(65) and Foucault(66) have legitimately highlighted as constitutive of the new hospital medicine dominant until the mid-nineteenth century.

Clinical Pedagogy.

In order to demonstrate that the generalisations recorded above accurately reflect the real historical experience of the medical education of the period rather than embody rationalistic, analytical constructs 'imposed' on the historical evidence, it is important to examine some of the pedagogical discourse of hospital teachers. Such discourse evokes the pristine cultural ethos of clinical medicine - uncompromisingly empiricist, relentlessly anti-systemic and anti-rationalistic, and resolutely confident of the sureties and certainties revealed in the wards of the clinic.

Few clinical teachers of the early Victorian period failed to emphasise the centrality of the subject of

anatomy (the most obviously practical of the medical sciences) to the student's education. J.T.Morgan, Lecturer in Clinical Surgery, counselled his students in 1838 to regard the acquisition of sound anatomical knowledge, which he defined as "a knowledge of the structure and functions of every tissue and organ throughout the body", as the fundamental object of their labour. Anatomy formed the rudiments of the medical profession; it gave medicine its coherence functioning as "the key-stone ... which <bound> together its different branches - the parent-trunk around which they all entwine<d>."(67) Morgan located his own understanding of anatomy and its relation to physiology firmly within the Hunterian tradition. Anatomy was the science of organisation; physiology the science of life. The one disclosed the organs and textures of which the body was composed; the other explained their use and the relation which they bore in the economy of life. The researches of Hunter and also of Bichat, in Morgan's view, had reconstituted physiological anatomy.

Henceforth physiology could no longer be dismissed as

"a mere science of speculation, displaying the wildest flights of the imagination, the grossest absurdities and the most illegitimate reasoning, <for it had become> a science of facts and just theory, resting on the sound basis of improved anatomical knowledge and legitimate experiment."(68)

Students were thus induced into the Hunterian culture whereby physiology was defined in relation to, and dependent on, the founding science of anatomy. Knowledge

of the functions of organs and tissues of the body was so intimately associated with knowledge of their structural location within the topography of the body that an autonomous science of life detached from the study of organisation could not be envisaged.(69)

Morgan's students were not only advised of the pivotal role of anatomy in their medical studies, but also instructed to give priority to its practical demands. Morgan enjoined them to immerse themselves in the practice of anatomical dissection:

"do not rest contented with what others may be pleased to point out to you, for this will not suffice; dissect, rather with your own hands, every muscle, nerve and blood-vessel, and endeavour to understand and fix in your mind their use, relation and distribution; examine every organ attentively, consider its size, position and structure, by what nerves and blood-vessels it is supplied, and in what manner it is enabled to carry on its respective functions."(70)

The diligent performance of the neophyte's traditional rite furnished the basis for the resolution of anatomical and physiological problems alike.

Most hospital teachers shared and endorsed this conception of the proper relationship between anatomy and physiology - that a most minute and careful study of structure must ever precede and pave the way for any theory of function. C.Collingwood, a teacher of microscopical histology, defended in 1859 anatomy's crucial position as "the alpha and omega of medical and surgical science." His unchallenged assumption was that

the discipline of anatomy was the bedrock of safe and scientific practice. In Collingwood's view, the cultivation of anatomy, in tandem with its sister science of physiology, was the surest guarantee of operating "the levers which must work the progressive advance of scientific medicine." (71)

For decades, the 'Lancet' repeatedly directed its sizeable student readership to the assiduous prosecution of the practical aspects of professional training rooted in the pathological anatomy of the ward and the dead-house. Reflecting the contemporary prestige of anatomy grounded in practical dissection, the editors insisted in 1827 that the student must perforce "dissect for himself, in order to acquire a thorough knowledge of the structure of the human body." (72) Divorced from instruction at the bedside of the patient in the wards of the hospital, the physician would inevitably commence the practice of his profession in the dark.

This pregnant metaphor of darkness and night only receding to light and day through direct and immediate contact with the sick in the wards and the cadavers in the dissection-room was a recurrent motif of clinical teachers' pedagogical discourse throughout our period. One of its principal corollaries - the denigration of mere book knowledge as patently inadequate to the primary objective of medical education - was likewise continually intoned. In an editorial on clinical teaching in 1854, the 'Lancet' declared forthrightly

that it was simply 'impossible' to exaggerate the importance of practical instruction and systematic training in the practice of "the first and greatest operation - that of making a correct diagnosis." (73) On the subject of appropriate pedagogy, the editors contended that the term 'clinical lecture' was effectively a misnomer, a contradiction in terms which resulted from incongruous modelling of clinical instruction on the systematic lectures of the schools. Teaching clinical medicine demanded a pedagogy which was sui generis and differed toto coelo from the static book-based approach of the medical literati.

These normative pedagogical judgements were accompanied by some practical prescriptions: clinical teaching should start at the bedside of the patient and include physical examination, prognosis and treatment; students should actively participate in the examination; and the cases examined should be those encountered in routine practice. The very term 'clinical lecture' was moribund and ought to be replaced, in the Lancet's view, with 'clinical exposition' or 'the demonstration of disease at the bedside'. (74) The editorial demonstrated the interest within the profession in the association between a particular educational product viewed instrumentally (a proficient practitioner trained in the techniques of the new clinical medicine) and a particular mode of pedagogy (heuristic, practical instruction).

Still maintaining as late as 1874 its traditional advice to medical neophytes, the 'Lancet' cautioned;

"the best books or teachers cannot make up for your own senses in laying the foundations of your knowledge. Whatever you have seen with your own eyes, heard with your own ears, handled with your hands, and thought out for yourselves, will leave a deeper and firmer impression on your minds, and be far more useful to you in after-life, than anything you have acquired through books or teachers."(75)

Properly-conceived medical education found its rationale only in the hospital and the dead-house where "minute and accurate observation <was> everything." This clinical message was reinforced through rhetorical appeal to the authority of Charles Darwin - "one of the most consummate and sagacious observers the world <had> ever seen", all of whose "vast conquests of thought" had been won by "strict adherence to the philosophy of fact."(76)

Between the establishment of the 'Lancet' in 1823, and the publication of this clinical advice to students in 1874 occurred a whole panoply of important developments (including recognition of the centrality of physical signs to clinical diagnosis; the expansion of new clinical methods such as auscultation, microscopy, endoscopy and chemical analysis; the virtual acceptance of bacteriology and germ theory; the advent of antisepsis and anaesthesia as aids to surgical practice; the proliferation of technological innovations) which together effected a total reconstitution of the

epistemological foundations of medicine conceived as a field of knowledge.

Yet despite these vital far-reaching changes - inadequately comprehended in terms of the simple emergence of 'scientific medicine'(77) - the clinical 'Weltanschauung' proved remarkably resilient, unaltered as a mode of 'seeing' the reality of disease, and as an underlying philosophy which conferred a privileged perception on the clinical teacher and receptive student alike.

The most remarkable, and paradoxical, aspect of the new clinical medicine was the philosophical, systematic and dogmatic manner in which its partisans condemned the philosophy, system and dogma purportedly expressed by its adversaries in defence of 'scientific' medicine. The preoccupations aired in the pedagogical discourse of William Walshe, Professor of Clinical Medicine at UCL, afford vivid insight into these dimensions of metropolitan 'hospital' medicine. University College Hospital, as observed in chapter six, was the first to provide systematic clinical instruction for medical students as a deliberate act of policy. Walshe's tenure of the professorship in clinical medicine there assumes considerable importance in our attempt to decipher the cultural ethos of clinical education.

Walshe expounded a medical philosophy which represented one strategy of the defence of clinical

medicine - a strategy developed in connection with a particular institutional milieu. University College Hospital was untypical of London as a whole by virtue of its affiliation to the new university: Walshe's style of defending the clinical ideology cannot be assimilated unproblematically with others adopted in alternative (non-university) hospital schools. Walshe's justification of the clinical tradition reflected the fairly widespread acceptance in early Victorian England of a strongly neo-Baconian, Whewellian and inductivist conception of science. As appropriated by Walshe, as a practising clinician, a thoroughgoing critique of 'transcendental' notions of particular sciences such as chemistry and physics was quite compatible with a staunch defence of clinical pathology as 'science'.

Walshe explicitly titled his course of lectures 'Pathology as Science'. In his view, pathology was a science *sui generis*, existing in splendid isolation from sciences such as experimental physiology. Scientific pathology would be established by cumulative observation of cases and careful systematic induction: it would never be derivative of experimental procedures or laboratory science. In sum, clinical science stood for Walshe over, above and beyond the sciences of nature and life.

In 1845, Walshe reflected with pride on the

remarkable recent advances in medical knowledge and practice, which had vastly outstripped previous generations' attempts to comprehend disease and mitigate suffering. Walshe singled out as one of the most efficient causes of the improvements in medical science, "the virtual abandonment of all exclusive systems, or codes, of general theory" such as had been rampant during the first half of the eighteenth century. Theoretical medicine, in Walshe's estimation, consisted in the abandonment of logical principles and the tendentious defence of flagrant instances of argumentum a particulari ad universale.

The Paracelsian system, the iatro-chemical system developed by Sylvius, the iatro-mechanical system of Borelli, and Stahl's animism had been superseded by what Walshe (in common with many contemporary clinicians) saw as a 'bete noire' and referred to disparagingly as "the narrow and one-sided doctrine of Irritation conceived by Broussais." (78) Walshe's students were encouraged to celebrate the demise of systemic medicine: no longer need they take credence from

"Pneumatists, Archaeists, Animists, Vitalists, Sectarians of Iatro-chemical or Iatro-mechanical creeds, Brunonians, Solidists, Humoralists, Broussaisians, Rasorians." (79)

In the past inadequate attention to 'facts' and disregard for opposing 'facts' had contrived one false system after another; but the recent tendency to abandon

the futile quest to discover universally-applicable laws governing the operation of disease phenomena had brought investigators back to the observation of nature. Walshe had no doubt that the direct cause of medical progress was "none other than the general adoption of close OBSERVATION and INDUCTION in clinical and pathological research." (80) In support of this affirmation of simple observation as opposed to the quest for scientific laws, Walshe somewhat dubiously appealed to "the vast intellect of Newton disdaining all petty scholastic disputations regarding causes." (81)

Five years later in 1849, Professor Walshe's address to medical neophytes assumed an even more aggressively polemical anti-rationalistic and anti-systemic inflection. Clinical medicine, Walshe contended, was "that department of our science which is studied at the bedside; which stands in contradistinction to systematic medicine." The subject was defined from the outset in dialectical relation to its opposite discipline; only to clinical medicine (emphatically not theoretical) was the Baglivian maxim "ars medica tota est in observationibus" applicable. (82)

Walshe's stated opinions on therapeutics are unambiguous evidence of a fundamental cultural dichotomy in Victorian medicine expressed in irreconcilable intra-professional conflict over the ends of medical education. Walshe explicitly divided therapeutists into two mutually antagonistic parties:

"those who theorise<d> prior to experience and base<d> treatment upon such theory - the so-called Rationalists; and those who, unbiassed by preconceived notions, record<ed>, analyse<d>, count<ed> and interpret<ed> the results of observation of the action of remedies - the Observers."

Walshe poured scorn on the former, who

"assum<ed> themselves admitted into Nature's council chamber, speculate<d> on the mechanism of her doing, anticipate<d> her aims and <made> plans for her management. If events, perchance, clash<ed> with speculation, the so-called Rationalists care<d> not. Nature must be at fault in some way or other - any marvel you please must have occurred, rather than their hypotheses be admitted to be unsound."(83)

Walshe developed his uncompromising polemic against the rationalists by suggesting that the notorious 'heroic' treatment of blood-letting - a practice by no means obsolete in the mid-Victorian period(84) - was a natural outgrowth of rationalist therapeutics. His remarks on the 'failures' of medicine's scientific rationalists of the past were directed to a particular constituency - those who desired to transform clinical pathology by bringing it into ever closer connection with the concerns of physics, chemistry and experimental physiology. Those struggling in the 1840s to refashion clinical medicine in the image of experimental science were merely, in Walshe's opinion, the most recent descendants of medical rationalists who had been guilty, throughout history, of

"perpetually changing <their> notions of the essence of diseases - not in proportion as absolute knowledge of those diseases increase<d>, but whenever any discovery in

chemistry, or in physics, or in physiology, (that may <have been> tortured into seeming applicability to pathology) <gave> the loosest of warranties for such change."(85)

Vague speculations concerning the modus operandi of disease and remedies were the typical product of changing dogmas of physics, chemistry and physiology throughout the ages; and such endless a priori notions had prevented the maturation of the 'art' of medicine.

Walshe's critical onslaught on the pernicious evils of medical rationalism culminated in a charge which was loudly orchestrated by self-conscious clinicians elsewhere - that "Rationalism <had> not gifted practical medicine with one single enduring unassailable truth", nor achieved any "substantial results." University College's Professor concluded by directing students to the relentless prosecution of "Observation and Numerism", on which the achievements of the French clinical school were based: the "reign of theory" had terminated and clinicians had established the foundations for the future progress of medicine.(86)

The cognitive framework that underwrote this forceful and indomitably clinical pedagogy was inimical to the realisation of the professional objectives of Victorian life-scientists. It perpetuated a conception of clinical pathology as sui generis and independent of physiological science, or (as Walshe expressed it elsewhere) physiology remained "neither a Cassandra nor an Oedipus with respect to it, but merely a humble

handmaid."(87) The vested interests of clinicians in fending off professional encroachment from outsiders prolonged this cognitive framework which continued to be drawn upon as a cultural resource in clinical pedagogy.

Members of the teaching staff of St.George's Hospital Medical School endorsed the same pedagogy, tacitly acknowledging the same cognitive framework, as that of Professor Walshe at University College. H.W.Fuller directed the attention of his students in 1857 first and foremost to "the application of ... various branches of knowledge to the alleviation of human suffering, the prevention and the cure of disease." He invoked that god-head 'Nature' and assured his audience that their progress would be uninterrupted so long as they "consult<ed> her landmarks."(88) Clinical suspicion of rationalist book-medicine found an eloquent spokesman in Fuller. "You will soon begin to find", he cautioned his students in thoroughly Hippocratic tones,

"that books are poor interpreters of Nature's work; that disease is not so simple and straightforward an affair as authors would lead you to suppose, but varies infinitely in type, and presents a multitude of different phases according to age, sex, constitution and the like; ... although what you have learned from books and lectures may assist you in arriving at a correct decision, ... your treatment must be directed by general principles deduced from personal observation of disease and of the effect of remedies."(89)

The most valuable knowledge a doctor could possess could be acquired only through long-continued observation and experience culled, first hand, from the

dissection-room, wards and dead-house of a hospital. Fuller claimed that it was not his intention to denigrate the 'scientific' subjects of the curriculum, but the implicit meaning communicated as a pedagogical subscript of his lecture was precisely that; for he insisted that "a man may be a minute anatomist, a profound physiologist, an expert chemist, and nevertheless be an indifferent medical practitioner." (90) Without careful study by the bedside of the sick, a doctor was considered unfit to practise his profession.

Henry Lee, also of St. George's, shared Fuller's conviction that the ambit of medicine could be defined only in terms of praxis. In his conception, the central purpose of medical education was to acquaint students with insight into the operations of Nature on disease; his lecture consisted in a discussion of the most appropriate and effective means of imparting it. At different periods in the history of medicine, many forms of pedagogy had been advanced. Lee first considered rational methods, an emphasis on the lux intellectus lumen siccum, the handing-down of requisite insights as apprehended by pure, unaided reason; second, a traditional medical education founded on the texts of classical antiquity; and third, a utilitarian medical training. Lee's own predilections lay squarely with the last, for his students were advised that it was

"of the highest consequence in medical

education ... not so much that <they> should attain the abstract knowledge of the different branches of medical science, as that <they> should obtain practical wisdom in the use of that knowledge which <they possessed> ..."(91)

T.Holmes, St.George's Lecturer in Surgery, categorically endorsed the view that the idiom of clinical education must ever be measured in practical rather than theoretical terms. In 1867 he claimed that recent improvements in the system of medical education had been the consequence of both the increased importance attached to the practical study of disease in the wards as opposed to the mere attendance at courses of systematic lectures; and of recognition of the centrality of Morbid Anatomy and Pathology on the curriculum (on account of their utility for medical practice). The "final end" of medical education was emphatically

"not to teach the Students to answer questions, but to teach them to do things; i.e. to teach them the principles of Diagnosis and the rudiments of Therapeutics, so that when they enter<ed> upon independent practice they <would> be able to face its numerous and unexpected emergencies."(92)

Such desiderata, Holmes frankly confessed to his students, could never be acquired by a course of lectures but only "in the wards, by the education of <their> own senses and the exercise of <their> own observation." In Holmes' view, not the want of understanding of scientific principles or theories, but rather the want of "clinical experience" during their

student careers induced many aspiring doctors to fall into "those lamentable errors of diagnosis" frequently encountered in institutions such as St. George's Hospital School.(93) Holmes' voluminous "A System of Surgery" was one of the most widely-used texts of the period.(94)

In 1850, this utilitarian ideology of clinical education was advanced with equal vigour by Charles West, St. Bartholomew's Lecturer in Clinical Surgery. He invoked Bacon's acclaimed apophthegm on the fundamental purpose of knowledge as "sincerely to give a true . account of the gift of reason, for the benefit and use of man." To no other department of knowledge than medicine, in West's estimation, was this Baconian philosophy more applicable. Baconianism applied to medical education entailed the strict subordination of scientific theories and principles to the practical imperatives of the clinical ward. Chemistry, botany and comparative anatomy, whilst not entirely superfluous scientific disciplines, were not the primary concern of medical education. West's students were informed simply that they were "not to be botanists, nor comparative anatomists, nor chemists - but doctors."(95) West was an archetypal advocate of the surgical 'anatomical' perspective: students could learn the "alphabet of medicine" only in the surgical wards of the hospital.(96)

West alluded to a fundamental dimension of the experience of the sick man which eluded the grasp of

'scientific' efforts to quantify or codify it, and consequently stymied the elaboration of rational, scientific therapeutics. He cited Sydenham, Laennec and Prout in support of his contention that certain diseases affected different people in different ways, and that remedies accordingly differed in effectiveness. The teratological and nosological problems presented by the individual's experience of pathology were too inherently complex for rational apprehension. West directed his students not so much to the study of disease as to the diseased.(97) The idiosyncratic individual and unique experience of the sick man would ever form the ontological basis for clinical practice.(98) West's "Lectures on the Diseases of Infancy and Childhood" had been through five editions by 1865. Based on the examination of over forty thousand children at Gt.Ormond St. Hospital, West's text in clinical paediatrics was widely regarded as a vindication of the clinical 'Weltanschauung' applied to practical medicine.(99)

The most eminent of elite clinicians during the mid-Victorian period proved adept and talented at articulating sophisticated rationalisations for clinical medicine. William Stokes of Dublin, a powerful force in the medical profession with influential positions on both the BMA and the GMC, reflected in 1865 on the radical changes in medicine consequent upon recent discoveries in physiology, pathology and diagnosis. "We can hardly conceive a revolution in practice more

complete", he averred.

"Venesection is now, from being the most frequent, the rarest of operations. In place of the loss of blood, we have the exhibition of stimulants; in place of a system of almost starvation, we have careful use of nutriment."(100)

To what extent could discoveries in the medical sciences be identified as the source of such innovations in medical practice? Stokes weighed up the principal contenders - blastema and cell theory, the work of Virchow, Weber and Bennett - but was forced to conclude that "it <did> not appear that they furnish<ed> knowledge that would tell us why this or that line of treatment <was> from time to time found efficacious."(101)

There was something intangible, almost indefinable, Stokes implied, about the character of clinical phenomena that somehow eluded the explanatory grasp of medical science. The conditions by which the quality of life was preserved appeared to Stokes to be so subtle and complicated that the most refined and elaborate techniques of the physiologist and the chemist failed to explain why today's living creature might become tomorrow's decomposing mass of clay. Caution, he insisted, was necessarily required in adopting any therapeutic system based solely on scientific inference from visible organic change.

At a meeting of the BMA at Oxford in 1869, Dr. William Gull expounded his views on clinical observation,

proffering a convenient summary of what we are identifying as a coherent, distinctively clinical philosophy of medicine. Conceding the intimate connection of clinical medicine with its disparate underlying science, Gull nevertheless took pains to impress upon his audience that clinical medicine was first and foremost an autonomous amalgam of disciplines and practices that stood sui generis, if not in splendid isolation, clearly apart from its external ambience. As the epigraph to this chapter makes clear, Gull drew an invidious comparison between Hippocrates' efforts to vindicate the study of disease from the inroads of superstition in medicine's distant past, and the present task of safeguarding clinical instruction from the incursions of experimental scientists whose Procrustean physico-chemical reductionism was threatening to subvert clinical autonomy.(102) The dogmatism of physicists and chemists who reduced man's being to a mechanistic system of "galvanic batteries" or "oxidising machines" had blinded doctors to the realities which lay, beyond physics and chemistry, inscribed on the individual organs and tissues of each individual patient.(103)

The clinical student was frequently confronted with uncertain, even delusive, evidence. His task was to cope with, and relieve, immediate human suffering - a task which precluded reliance on the vicissitudes of experimental results derived from laboratory investigations. Gull complained that experimental

scientists were too apt to forget

"the difficulties we have to encounter, and the mental labour required for dealing with them with any measure of success. They would have us postpone their difficulties to a more convenient season, until, by the advancement of ... branches of science, their investigations could be undertaken with less risk of failure."(104)

All too often medicine had been diverted from her difficult path and her legitimate ends by those seeking to replace painstaking clinical study of the protean complexity of disease with dogmatic 'scientific' theories. Unlike scientific systematisers, Gull insisted, the modern-day clinician had "no system to satisfy; no dogmatic opinions to enforce", investing his confidence in an exhaustive experiential clinical pathology which would furnish the secure foundation for an efficacious therapeutics.(105)

On the ultimate subordination of scientific theories to the 'art' of therapeutics, and of the insufficiency or underdetermination of ontologically real clinical phenomena by specific scientific disciplines (such as chemistry, physics or experimental physiology) hospital clinicians spoke in almost unanimous accord. Arthur Foot of Dublin echoed Gull's cogent arguments concerning the autonomy and irreducibility of clinical facts. Foot's students were informed in 1871 that "<c>linical examination of the sick and medical management of disease <was> a special department of knowledge." They might well search and explore every conceivable

scientific discipline to its very confines, yet would remain "wholly ignorant of the information which <was> the backbone of medicine" without induction into the clinical dimensions of medical practice. Student's own senses, nurtured at first by qualified physicians and surgeons, were to be their teachers, the wards their schoolrooms, and sick patients their books.(106)

Foot's lecture reveals that as late as the 1870s, British clinicians were still defending the achievements (and their underlying structural basis) of the early nineteenth-century French clinical school. He advised neophytes to follow the example of J. Corvisart's pupil, Rene Laennec, who drew up minute medical histories of nearly four hundred cases of disease at the Charite Hospital, Paris. "All excellence in practical medicine", Foot explained, "radiate<d> from the one central point of observing and recording cases of disease"(107) Xavier Bichat, another avatar of the Parisian medical revolution, was invoked as exemplar. "The advice of Bichat", Foot's students were informed, was to

"attend to your hospital cases and open the dead. The examination of the bodies of the dead applies the crucial test to diagnosis, enables you to form a just estimate of treatment, and teaches you what the conditions are for the cure of which remedial agents are required ..."(108)

French clinicians left a long, lingering shadow over British hospital medical education in the Victorian period. Also in the 1870s, A.B. Shepherd, a clinical teacher at St. Mary's (the last of the London hospital

schools to be established) went so far as to describe book knowledge as "the most hateful of all knowledge."

His students were urged to

"<w>ork in our wards: come down with us into our outpatient rooms: see in that post-mortem room what mischief disease has done: read over with us the records of those post-mortem examinations: compare with us ... how far the life-history is supported and confirmed by the truth-telling silence of the dead body."(109)

Shepherd gave expression to a developed clinical ideology, a characteristic product of the institutional framework of the London hospital schools; and it is perhaps in this "truth-telling silence" that the essence of the clinical experience resides.

Indeed, what emerges from the evidence of these representative prolegomena to medical teaching is a vivid illustration of that tenacious clinical culture written about with impressive intellectual virtuosity by Georges Canguilhem and Michel Foucault, who shared a percipient sense that the essence of medicine was to be found in the clinic and therapeutics.

Most of the statements of pedagogical intent discussed above emanated from hospital teachers, often of clinical surgery. The metropolitan hospital medical school was a particular instance of Foucault's 'clinic' which provided an institutional matrix for the germination of unambiguous clinical ideologies. The characteristic 'restraint' of clinical discourse was manifest in teachers' self-conscious rejection of

'theories' and 'systems', in their proud proclamation that any taint of philosophy was dissipated at the patient's bedside. Clinical teachers stressed the closeness of medicine's relationship with an unmediated 'nature' which was transparent to the privileged perception of the doctor's gaze. Useless theoretical physiologies, such as Broussais' notorious 'irritation' doctrine, were brushed aside as irrelevant, even positively misleading, in an appeal to direct pre-theoretical clinical experience and a pragmatic reliance on results. In sum, the hospital with its wards, dissecting room, museum and dead-house became identified with the entirety of medical discourse, and was taken to provide incontrovertible demonstration of 'reality' in the direct perception of its regularities.

The development of hospital medical education in London was of critical importance to the history of the period. The hospital setting enabled increasing numbers of students to formalise their clinical experience, the acquisition of which became the over-riding objective of their education.(110) The extension of hospital facilities was, of course, part of a much wider phenomenon - a European hospital movement which was decisive in producing more systematic responses to new disease experiences.(111) Hospital development was critical in furnishing, for the first time, a supply of clinical material that was adequate for serious

research. The new environment generated a climate in which the hallowed doctrines of the ancients might seriously be called into question.

Paris first saw the far-reaching medical consequences, too vast to be confined to a single city. In London schools, many clinicians followed the lead of the French clinical school, focussing on morbid anatomy and the new techniques of physical diagnosis. The utilitarian ethos of the schools fostered a particular form of knowledge (thoroughly 'anatomical-chirurgical' in character) which fulfilled one simple function - the training of medical practitioners. Not only the practical ethos, but also the economic structure of medical education did not conduce to the emergence of the kind of medical science that different social conditions were fostering on the European continent.(112)

Significant reform in this direction in England did not materialise until the second half of the nineteenth century. How specific institutional characteristics impinged on medical knowledge may be gauged not only internationally but also by more localised considerations. As I have argued earlier, both UCL and KCL medical schools saw the most innovative changes which resulted in the decline of anatomical physiology and the emergence of a school of advanced microscopical histology. The association of these schools with the University of London accounts for the difference between

the more comprehensive courses taught there and the more pervasive 'anatomical-chirurgical' emphasis of other metropolitan hospital schools.(113)

Most medical students internalised the implicit 'Weltanschauung' of the clinician even at the more broadly-orientated schools. S.T.Taylor was a medical student at KCL in the 1860s. His diary affords valuable insight into the impact of clinical pedagogy on its intended audience. Taylor recorded that Lionel Beale, Henry Acland's pupil and one of the first to introduce a microscopical dimension into medical teaching, defended himself from "the attacks of self-styled practical men." He had evidently been at the receiving end of clinicians' propensity to denigrate scientific innovation. Yet if Taylor was a representative student, Beale was unsuccessful in impressing his undergraduate audience in this regard. "Dr.Lionel Beale", Taylor recorded,

"gave a lecture on Physiology, abounding as usual, with his pet theories about germinal matter, which seem to have little relation to the practice of medicine."

Nor did Beale's colleague, W.B.Todd, fare any better in Taylor's estimation. Taylor wrote:

"I must confess I was an earnest believer in Todd's theory until I became a clerk in the medical wards of King's College Hospital, when the terrible mortality in typhus fever cases shook my faith in Todd's theory."(114)

Taylor clearly experienced a sharp sense of discontinuity between the medical theory of the

lecture-room and the pristine reality of his first-hand clinical experience on the wards. Students underwent a contradictory socialisation process pulled towards opposite ends of the poles represented by the alternative cognitive frameworks of the scientific 'word' and the clinical 'ward'.

Clinical Education in Practice: The Case of Guy's.

We have demonstrated the obstinate persistence of an autochthonous clinical culture in Victorian hospital medical education and must now examine its principal empirical achievements. Individual hospitals made distinctive or disproportionate contributions to English medical education. The 'clinical-pathological' approach, as formulated by Morgagni and developed to its fullest expression by the Paris School of Clinical Medicine, found its most vigorous and effective English exponents at Guy's Hospital Medical School.(115)

The strength of its clinical department has customarily been associated with the extensive labours of Richard Bright (1789-1858), Thomas Addison (1798-1866) and Thomas Hodgkin (1798-1866).(116) The clinical accomplishments of this triumvirate drew substantially on the leading principles of French pathological anatomy, and were also indicative of a trend towards modelling metropolitan schools on the Scottish example. All three had studied medicine in Scottish schools.(117)

Richard Bright, son of a wealthy banker in Bristol,

graduated as an MD from Edinburgh in 1813. He studied at Guy's Hospital and returned to Edinburgh for further post-graduate studies. Before being appointed assistant physician to Guy's in 1820 (full physician in 1824), Bright travelled extensively and studied widely on the European continent. Bright was a staunch and uncompromising clinician in his insistence that a physician could only learn the 'art' of medicine in the dissection-room and in the cardinal importance he attributed to the study of morbid anatomy as queen of the medical sciences.(118)

In 1827, Bright published his acclaimed "Reports of Medical Cases Selected with a View to Illustrating the Symptoms and Cure of Disease by a Reference to Morbid Anatomy."(119) The principal objective of this work, accomplished by meticulous observation and careful study of specific clinical cases, was "to connect accurate and faithful observation after death with symptoms displayed during life."(120) His 'Reports' included detailed descriptions of twenty-three cases of renal disease, with dropsy and albuminuria, together with post-mortem reports of all fatal cases. From Bright's interest in dropsy emerged a new ontologically real eponymous disease differentiated from the symptom-complexes with which it had hitherto been confused and identified. Bright's work led to the definition of other specific conditions (otitis following scarlatina, tuberculosis of the peritoneum, and acute yellow atrophy of the liver)

in clinical-pathological terms.(121)

Similarly, Hodgkin's clinical studies on lymphadenoma led to his identification of a new disease in 1832.

'Addison's disease' was identified in 1849 on the basis of thorough clinical examination of cases of pernicious anaemia. The ultimate goal of such painstaking clinical analysis was the elaboration of an accurate and comprehensive nosography derived from breaking down symptom-complexes into their variegated pathological elements defined in the manner of Laennec in terms of their characteristic lesions at autopsy.(122)

By the 1850s, the performance of approximately two hundred and fifty post-mortem examinations annually at Guy's provided physicians with the means to accomplish these clinical goals. In 1842, Guy's became one of the first hospitals to possess a clinical research laboratory attached to the ward. This facility was established by Bright as an adjunct to the educational and research activity of the hospital. Here students examined the blood and urine of patients to further research on renal disease. In sum, by mid-century Bright was the acknowledged leader of a definite 'school' of clinical medicine based at Guy's Hospital.(123)

It is important to consider how the techniques and methods of chemical analysis were brought to the service of clinical medicine at Guy's. From the outset of the nineteenth century medical chemistry figured in the hospital's curriculum in two principal guises. First, it

comprised the study of the chemical properties of animal solids and fluids such as blood, bile and urine, and was known as 'animal chemistry'. Second, the subject entailed analysis of the chemical composition of substances known to impair or improve the functions of the living body - chemical pharmacy applied to clinical medicine. Students were involved in practical demonstrations and experiments organised in a small laboratory attached to the chemistry lecture-theatre.(124)

The arrival in 1811 of Richard Bright and William Prout (1785-1850) presaged the development of a more cohesive research unit in clinical chemistry. Prout, often regarded as the father of chemical pathology, published a series of papers on urine analysis and digestion between 1815 and 1827, in which he sought to build on methods of organic oxidation analysis developed by Berzelius and Gay-Lussac. Prout's own researches culminated with the publication of a text-book in 1840 "On the Nature and Treatment of Stomach and Renal Diseases."(125)

The increased interest of physicians in the potential application of chemical analysis to the problems of therapeutics by the 1840s was part of a wider shift of emphasis away from the study of solids to fluids as a critical aid to medical diagnosis. As one commentator explained in the early 1840s, "the changes which <took> place in the fluids of the body, during the course of

various diseases, seem<ed> to be daily acquiring increas<ed> importance in the eyes of medical men." This disposition to return to the study of fluids "form<ed> a very prominent feature of the medical mind at <that> time, as evinced by the number of interesting researches to which it <had> given rise."(126)

The shift, of which Bright's meticulous clinical analysis of urine was a crucial exemplar, however, did not entail any fundamental 'rapprochement' between exponents of the two traditions of the 'word' and the 'ward'. In Bright's view, chemical methods must ever be utilised in relation to clinical exploration of the problems presented in each specific case. The result of such exploration had then to be correlated with the evidence of post-mortem examinations. As Reiser has legitimately argued, many of those who sympathised with the neo-humoral revival and the role of chemical procedures in furthering it

"nevertheless retained the structural viewpoint of anatomists, and regarded chemical analysis as a refined type of dissection: it detected effects of disease that eluded the anatomist's scalpel."(127)

Those who extolled Bright's use of chemical results as an aid to clinical diagnosis did so largely out of their appreciation of morbid anatomy and new techniques of physical examination, not because of any belief in the therapeutic value to medicine of experimental chemistry.(128) Even the extensive use of chemical procedures which underwrote Bright's own research

conformed to a conception of chemical science as essentially a servant or underling of medicine, "informing and augmenting the more traditional methods of diagnosis, but not in any sense replacing them."(129)

Many clinicians remained extremely sceptical about the practical fruits that might be harvested on the seeds of the scientific method. Robert Graves, a leading figure of Irish medicine whose "Clinical Lectures on the Practice of Medicine"(130) was a highly-regarded text, judged in 1848 that as regards

"any benefits derived from analytical chemistry in solving the problems of vital action or elucidating the functions of the various organs in health and disease, they may be said to be few, unimportant, and inconclusive."(131)

The efforts of those who wished, on professional grounds, for a closer identification of analytical chemistry with practical medicine were confronted not only with this kind of defensive clinical rhetoric, but also with the further problem that medical chemistry and materia medica had long been the province of the lowly apothecary despised as socially inferior by the elite of physic and surgery alike. For these reasons and all we have observed of the strongly practical and utilitarian ethos of metropolitan schools, the work of Bright's department at Guy's represented perhaps the furthest extension of 'science' into medicine that was possible within the irredeemably clinical parameters of the hospital mode of medical production.(132)

THE SCIENTIFIC 'WORD': EDUCATION IN EXPERIMENTAL MEDICINE.

"<T>he future of pathology and of therapeutics, and, therefore, that of practical medicine, depends upon the extent to which those who occupy themselves with these subjects are trained in the methods and impregnated with the fundamental truths of biology." T.H.Huxley.(1)

"In the higher forms of animals, and more especially in man, the animal life dominates over the organic life, which becomes its slave, and exhibits the remarkable phaenomena of mechanical force, of geometrical instinct, of animal cunning, and finally, in man himself, produces intellectual work, rising to its highest form in the religious feeling that recognises its great Creator, and bows in humility before Him. It is a simple matter of fact, and of everyday observation, that all these forms of animal work are the result of the reception and assimilation of a few cubic feet of oxygen, a few ounces of water, of starch, of fat, and of flesh." Reverend Professor Haughton.(2)

Present day historians and sociologists of science and medicine are displaying increasing interest in the laboratory as the institutional locus of scientific activity and the concrete site in which scientific 'reality' is crafted, manufactured and constructed.(3)

At one level, interest centres on the complex minutiae of the specific micro-processes whereby the data and ultimately the conclusions of science are fabricated in the laboratory. An anthropology of science has emerged which, adopting ethnographic techniques and methodologies concerned with in situ monitoring of the activity and behaviour of 'scientists' in the setting of the laboratory, focusses upon the routine work practices

by which 'scientific facts' are daily constructed and reproduced.(4)

Emphasis is placed on the processes of literary inscription by which scientific 'documents' and 'papers' are produced in the laboratory, and some scholars have adopted a form of discourse analysis as the critical intellectual resource for an understanding of the elusive phenomenon of scientificity.

There is, of course, a risk of producing a new, more sophisticated, internalism; but it is important to remember the central insight of Pierre Bourdieu that

"the scientific field is the locus of a competitive struggle, in which the specific issue at stake is the monopoly of scientific authority, defined inseparably as technical capacity and social power."(5)

We must also not forget that scientific knowledge manufactured through experimental procedures in the laboratory cannot be separated out from wider social matters any more than it can from the prior intellectual traditions established in the relevant scientific field. The career structures of experimental scientists, sources of funding and patronage, and the social interests which support or oppose a particular field of scientific research are all relevant and important.(6)

It is quite illegitimate for an historian to focus on the laboratory and the experimental activities of Louis Pasteur in order to explain the origins of bacteriology and the discovery of the microbial universe in terms of his 'disinterested' adherence to the canons of the

experimental method or his individual scientific genius.(7) On the contrary, Pasteur's laboratory - the site of his experimentum crucis of 1861, which finally laid to rest the 'metaphysical' doctrine of spontaneous generation or heterogenesis, and the scene of the discovery of the anthrax bacillus - was, in a sense, a microcosm of French society which mediated the conflicting social goals and interests which inevitably clustered around this unprecedented scientific phenomenon.(8)

Pasteur's laboratory exerted a remarkably destabilising influence on the society of its day: as Latour has contended in a trenchant analysis,

"<i>t <was> through laboratory practices that the complex relations between microbes and cattle, the farmers and their cattle, veterinarians and farmers, veterinarians and the biological sciences <were> going to be transformed."(9)

Pasteur's laboratory socially constructed the large interest-groups concerned with microbiology: what was revealed within its walls about the mysterious microbial world existed in a state of spatio-temporal symbiosis with the macroscopic social, economic and political preoccupations of those who populated its external ambience.

These reflections on the historic significance of Pasteur's laboratory and the speciousness of the internalist/externalist controversy in the historiography of science serve as an apposite preface

to this chapter on the development of laboratory medical education in Victorian England. The strategic location of Pasteur's laboratory in French society of the 1860s effectively entailed dissolution of any inside/outside dichotomy, or of any boundary between the 'in-there-ness' of the esoteric, labyrinthine intricacies disclosed by his laboratory apparatus and the 'out-there-ness' of the macro-structural interests and forces comprising the society in which it was located. Likewise, the laboratories attached to the medical schools or located in the universities where English medical students were instructed in experimental medicine, mediated the (artificial) tension between the esoteric content of the scientific knowledge communicated via the educational process, and the particular social and historical constellations of forces comprising the environment in which that process took place.

Medical schools functioned to some extent as seedbeds during the critical mid-Victorian period for the germination of a profession of experimental scientists who espoused a particular conception of scientific knowledge - naturalistic, experimental and vivisectional - and deployed it in part to serve their professional interests.(10) The medical pedagogy accompanying and contributing to this process of professionalisation and the polemical purposes it served is the principal concern of this chapter.

Laboratory medicine, as distinct from hospital

medicine, gave rise to a particular form of medical cosmology profoundly oriented around the scientific 'Weltanschauung'.(11) Medicine, ex hypothesi, was identical with the concepts, techniques, cognitive processes, perceptions - in sum, the intellectual 'gestalt' - of experimental scientists whose interests underwrote and were partly expressed in this cosmological scheme.

Of course, the transition from hospital to laboratory medicine is a matter of great complexity which varied in different nation-states and occurred over different time- scales: programmatic formulations about long-term structures must not be allowed to obscure the peculiarity of historical contexts and periods. Nevertheless, it is surely correct to emphasise the far-reaching and potentially subversive implications of the historic transition to laboratory medicine, for its emergence precipitated a complete transmutation in the epistemological conditions constituting medicine qua field of knowledge. As Jewson has cogently argued,

"the scientific revolution in medical knowledge may be said to have undermined the very existence of medicine as a distinct discipline in its own right. Medicine ceased to be a subject defined by its explicit and exclusive contents, and became instead an applied science, consisting of a pragmatically derived range of disciplines and techniques, distinguished by its specific purpose."(12)

Such a profound metamorphosis clearly threatened the entire culture of clinical medicine espoused by those

hospital teachers who celebrated so loudly its splendid autonomy from, and irreducibility to, the prescriptive edicts of particular sciences. The conflicting interests of hospital clinicians and scientific research workers produced the markedly conflictual temper of medical pedagogy.

Heterogeneous shades of opinion were represented in a wide-ranging debate, but two major schools of thought on the future of medical education stand out: one group applauded the increasingly scientific and experimental thrust of recent developments and sought to extend the involvement of laboratory scientists in the practice of medicine; the other remained steadfastly resistant to these same developments and sought to preserve the long-established traditions of clinical autonomy and the 'art' of medicine.(13) This chapter complements our previous discussion of clinical education, making explicit the long-term historical importance of opposition between the poles of the clinical 'ward' and the scientific 'word'.

Where Parisian hospitals in the epoch of the French Revolution formed the epicentre of the hospital mode of medical production and the clinical pedagogy to which it gave rise, the state-supported laboratories of German universities announced the hey-day of the new 'scientific' medicine, the demise of pathological anatomy as the commanding intellectual matrix for medical study, and its replacement by the new

paradigmatic science of experimental physiology.(14) We commence with a brief historical sociology of German education in scientific medicine as a prelude to our central discussion of the expansion of laboratory medical education in Victorian England.

German Medical Education.

By the mid-nineteenth century Germany was becoming recognised as the leading European country in the field of the bio-medical sciences. For Germany could boast of outstanding anatomists such as His, Waldeyer, Hyrtl, Henlé and Kolliker; physiologists of the stature of Ludwig, Du Bois-Reymond, Brucke, Pfluger and Heidenheim; pathologists such as Klebs, Von Recklinghausen, Cohnheim, Weigert and Virchow; its teachers of internal medicine included Wunderlich, Traube, Kussmaul, Frerichs and Von Ziemssen; and its surgical teachers Von Langenbeck, Voltmann, Thiersch and Billroth.(15)

Of course, this mere biographical compilation of Germany's most prominent individual physicians and surgeons proves nothing per se. However, a variety of alternative comparative indices also point to Germany's supremacy in the bio-medical sciences during the second half of the nineteenth century. Table 8'A', comprising comparative statistics on medical discoveries, documents the creativity of German medical scientists. Table 8'B' provides comparative data on medical careers and further confirms German pre-eminence.

By the 1840s, German chemical laboratories were more

numerous, better-equipped and more suitable for medical purposes than those of her competitors. The abundant facilities for specialised research and a supportive institutional context henceforth worked to maintain German superiority until the early twentieth-century reform of medical education in the USA.(16)

As observed in earlier discussion of French clinical education, the changing destinations of American medical students seeking the best professional education can partly be read as a barometer gauging the rise and fall of the world's medical schools. In the late eighteenth century Americans such as Benjamin Rush, John Morgan, William Shippen and Jonathon Potts crossed the Atlantic to attend classes at Edinburgh University Medical School.(17) The next generation of American students transferred their allegiance to Paris(18) where many became devoted students of Pierre Louis.(19) By the second half of the nineteenth century, ambitious young American students were flocking, in turn, to Germany, "the medical capital of the world"(20), attracted by eminent full-time professors and well-equipped laboratories that had no equal elsewhere.(21)

In England too, reformers looked enviously at German medical schools aggrieved at unmistakeable signs of Teutonic superiority. On the basis of articles published in official journals in the medical sciences during the 1860s, German pre-eminence over England obtained in as high a ratio as seven to one.(22) The publication of so

many such articles in Germany is a clear indication of the existence in that nation-state (which it formally became after the Franco-Prussian War in 1871) of a dispersed community of research-oriented medical scientists.

Germany's position as the pioneer of scientific medical education and successor to France as acknowledged world centre of 'progressive' medical science is not in doubt; but how is this historic eversion to be explained? One major explanatory strategy frequently pursued by medical historians will be eschewed here. This is the positivist predilection for highlighting the 'remarkable' peripeteia which, within so short a time-scale, ushered in 'genuine' experimental medicine from a prior situation in which German science was, in Cardwell's words, "bogged down in the more mystical notions of the Middle Ages and the Renaissance." (23)

Customarily, such positivist historians implicitly berate the 'Naturphilosophie' and the romantic, idealistic excrescences which supposedly imprisoned German 'Wissenschaft' within the confines of quasi-Hegelian metaphysical and transcendental systems of thought, and focus on the emancipation of 'scientific' medicine accomplished in the mid-nineteenth century by far-sighted physician-scientists. (24)

Adopting this explanatory framework here would obviously run against my comments in chapter one. It would also

disguise the extent to which 'Naturphilosophie' was connected to what was subsequently evaluated as 'good' science.

What follows here is a more sociological analysis of the main elements of the German historical experience: early nineteenth century reform of higher education; the degree of 'fit' between different sectors of the educational system; and the strong involvement of the state in educational affairs.

Of course, at the outset of the nineteenth century 'Germany' remained a patchwork quilt of numerous, variegated political units, each claiming and enjoying full rights of sovereignty and independence. Although the rise of Prussia and the Hohenzollerns in the eighteenth century had begun to galvanise forces for national rejuvenation, it required the French Revolutionary and Napoleonic Wars to provide the external stimulus necessary for large-scale social and political reform, and, in turn, for a major reconstruction of Germany's educational institutions and provision.(25)

The reconstruction of the university system and, in particular, the explicit way 'professional' education was incorporated within a wider educational philosophy espoused by the architects of reform, proved critical to the successful efforts of German medical scientists to capture the erstwhile scientific supremacy of their French rivals.(26)

Early nineteenth century educational reform was effected by an alliance between Prussian upper bureaucrats and the 'intellectual' class. These combined to thwart the Enlightenment programme of attacking the ancient universities, impugning the classical culture they propagated and instituting an entirely new mode of professional training outside the universities. Reformers succeeded in reasserting the monopolistic position of the university and in promulgating a philosophical justification for including professional studies within the cultural and intellectual umbrella of the university.

In articulating this rationale, educational reformers drew upon contemporary German intellectual resources to formulate an important distinction between, on the one hand, the general scientific-philosophical elements of professional education which were the legitimate concern of a university, and, on the other, more specifically technical aspects of professional training more suited for apprenticeship schemes. Schelling's acclaimed "Vorlesung uber die Methode des Akademischen Studiums"(27) of 1803, held up the ideal of the pursuit of 'Truth' - meaning that comprehensive, synthetic, all-embracing form of knowledge connoted by the German term 'Wissenschaft' - as the ultimate educational goal of any true universitas. This proved valuable to reformers in their efforts to derive some common philosophical basis to serve as the core of all

university education, expressly including 'professional' studies such as law and medicine.(28)

Karl Wilhelm von Humboldt (1767-1835) was the principal architect of the rejuvenation of Germany's universities. As Minister of Public Instruction in Prussia during the first decade of the nineteenth century, Humboldt was in a powerful position to institute reforms. In 1810, he was instrumental in establishing the University of Berlin whose ideals were concordant with the romantic and idealistic humanism collectively espoused by such formidable intellectuals as Schiller, Fichte, Schleiermacher and Schelling. Sanctioned by the state, Berlin represented a neoteric type of university which embodied the twin ideals of 'Eisemkeit' and 'Freiheit'. Humboldt emphasised that these ideals were essential to the scholarly pursuit of 'the pure idea of science'.(29)

Humboldt envisaged a particular type of medical education which contrasted sharply with English medical schools' utilitarian training. He sought to justify medical study as true 'Wissenschaft' whose comprehension demanded erudition in broader academic fields than the strictly medical. In 1809, Humboldt insisted that medicine was

"not only a technical discipline ... but a rational science which <could> only be studied in connection with historical, mathematical and philosophical sciences which <were> the propedeutics(sic) of all rational education."(30)

Medical education, ex hypothesi, was a fundamentally theoretical endeavour which positively demanded the academic setting of a university medical faculty, financed and administered by the state.(31)

Humboldt also vigorously opposed the prevailing educational philosophy which ascribed to the universities the function of teaching the sciences, whilst delegating the function of scientific research to separate institutions like the academies. On the contrary, Humboldt was staunchly committed to the principle of the unity of research and teaching. This entailed repudiation of a programme envisaged around 1800 for the development of German medical education whose acceptance would have led to the establishment of medical schools outside the sphere of the universities.(32)

In another respect, Humboldt's characteristically German breadth of vision proved critical to stamping a distinctive national character upon it. His comprehensive, integrated vision of medical 'Wissenschaft' expressly excluded the bitter sectarian divisions between 'scientists' and 'clinicians' so evident, according to our thesis, in the historical development of English medical education in the nineteenth century. Humboldt sought to stimulate bio-medical research which embraced both clinical and laboratory forms of medical work, thereby engendering a more symbiotic and synthetic 'scientific clinical

pathology'. Simmer's reference to a basic "contiguity of the sciences and the clinic in the modernised university"(33) overestimates the degree of reciprocity between the two traditions of the 'word' and the 'ward', but the relationship between scientists and clinicians in Germany was undoubtedly less belligerent than in mid-Victorian England.(34)

German medical teachers were also more advantaged than their English counterparts in being able to attain the much coveted status of 'Akademiker'. The social cachet purchased by the achievement of this position also redounded to the advantage of medical students. In Germany, intra-professional conflict between a medical and surgical elite on the one hand, and rank and file practitioners on the other, was much less endemic, if not completely absent, than in England.

The Humboldtian reform of secondary education was another conspicuous contrast with the English experience. The decisive impact this reform exerted on the future direction of medical education is suggested by one scholar's contention that "<a> specific kind of secondary school education was to become an essential condition for the quality of doctors in Germany in the nineteenth century."(35)

This was the German 'Gymnasium' whose neohumanistic form was envisaged and established by Humboldt. At the age of nine or ten, pupils were admitted to these schools after their primary education. Classical

languages and culture comprised the educational core of the curriculum, but Humboldt's conception was broader, also embracing the psychology and philosophy of language and mathematics.(36)

'Gymnasia' were the major feeders of German universities after the Humboldtian reforms, but it is misleading and whiggish to ascribe the success of university medical education directly to the degree of 'fit' between the secondary and tertiary sectors of the educational system, for this obscures the extensive debate over the merits and demerits for scientific and medical education of the 'Gymnasium' as compared with its rivals the 'Realschulen' and, later, the 'Oberrealschulen'. Intimately embroiled in this disputation was a serious controversy over the legitimacy of classical languages as appropriate subject-matter for 'modern' curricula. Where classics had pride of place on the Gymnasium's curriculum, the 'Realschulen' and 'Oberrealschulen' gave far greater emphasis to the natural sciences, modern languages and technical subjects.(37)

Which of these different types of secondary school was the most eufunctional for German medical education was one of the most keenly debated questions in medical circles throughout the nineteenth century. Two renowned German authors, Theodor Billroth (1821-1894) and Theodor Puschmann (1844-1899), who published classic treatises on the history of medical education(38), were in

fundamental disagreement over this critical question. Billroth strongly defended the 'Gymnasium' and the real educational value of studying Latin and Greek.(39) Puschmann, by contrast, was unreceptive to arguments stressing the supposed cultural advantages that study of the classics conferred, adopting a more practical conception of the goals of medical education.(40) The intense debate in Germany over such curricular and academic desiderata again contrasts with the more ad hoc manner in which the same issues were debated in England.

The respective publication in 1840 and 1842 of two influential treatises by German chemist Justus Liebig - "Organic Chemistry in its Application to Agriculture and Physiology" and "Animal Chemistry"(41) - was, in part, a reflection of these national contrasts. By this time, Germany was clearly forging ahead of France as the nation 'par excellence' of scientific and medical research. For more than a decade, Liebig (1803-1873) had been the instigator and charismatic director of a 'research school' in chemistry at Giessen - the prototype of university-based laboratory research on which other schools were, with greater or lesser success, subsequently modelled.(42)

Liebig's early studies on the isomerism of cyanic and fulminic acids made a formidable impression on his contemporaries. The 'chemist breeder' formulated a research programme in organic chemistry which formed the

basis of an effective research school, defined as a group of "mature scientists pursuing a reasonably coherent programme of research side-by-side with advanced students in the same institutional context and engaging in direct, continuous social and intellectual interaction."(43)

Although it would be over-simple to present Liebig's scientific accomplishments as a direct product of the Humboldtian educational reforms, it is true, in a general sense, that modern research schools are critically dependent on the institutionalisation of the sciences within a national university system. Also critical, given that no scientific research exists in splendid isolation, is the relationship between the school's laboratory and the society (including local contingencies) outside it.

Historians have long recognised that the dependence of German industrial development on chemistry, and the wider perception there of the direct bearing of the scientific work of research laboratories on effective industrialisation, greatly favoured the professionalisation of science.(44) The institutionalisation of the industrial aspects of science ensured a positive response in Germany to the appeal of the scientific profession for professional rewards and social legitimation based on its utilitarian function. Medicine was not necessarily exceptional in this respect. Liebig himself developed strong interests

in chemical physiology and public health: far more in Germany than in England was medicine perceived as an 'industry'.(45)

Physiologists were, at first sight, among the most conspicuous beneficiaries of Germany's state-supported system of higher education. What Liebig had established at Giessen for the science of chemistry could be adapted for the bio-medical sciences. Johannes Muller (1801-1858), often seen as the 'father' of modern physiology(46), established a scientific research school in physiology at the University of Berlin between 1833 and 1858. Like its predecessor at Giessen, Muller's school utilised laboratory methods of investigation and gave precedence to practical, heuristic methods.(47)

Muller's wider intellectual outlook was a complex synthesis of Aristotelian finalism, Kantian holism, and more contemporary 'Wissenschaftliche' currents of German thought.(48) Immensely influential as a heuristic guide to 'modern' methods of investigation in the medical sciences was Muller's "Handbuch der Physiologie des Menschen fur Vorlesungen" (1833-1840), translated into English as "Elements of Physiology" between 1837 and 1842.(49) This germinal treatise helped to establish a symbiotic interchange between physiology and hospital practice in Germany: it was recognised throughout the world as a classic statement of physiology conceived as an autonomous scientific discipline rather than an adjunct to anatomy. Muller's magnum opus was also a

starting-point for the mechanistic concept of life-processes elaborated subsequently by some of his pupils, including Hermann Helmholtz, Emil Du Bois Reymond and Rudolf Virchow. Muller himself remained wedded to a problematic of observation rather than experiment.(50)

Liebig's and Muller's research schools were not isolated islands of scientific creativity. Karl Ludwig (1816-1895) established three experimentally-oriented departments on the Giessen model at Zurich (1849), Vienna (1844) and Leipzig (1865).(51) By 1864, there were fifteen full professorships of physiology at various universities throughout Germany.(52) On a broad definition of 'scientific' subjects, no less than two hundred and sixty professional staff were engaged in teaching science that year. Such is the scale of the scientific phenomenon that demands explanation.(53)

In one form or another, the thesis that the extensive professionalisation and research orientation of the medical sciences in Germany derived from the specific character of the university system has enjoyed wide currency. In his classical study of the late nineteenth century familiar to all students of the history of science, Merz identified the 'scientific spirit' in France and Germany as "identical with the history of two great organisations, the Paris Institute and German Universities"(54), contrasting both with English Universities and their obsessive preoccupation with 'liberal education'.(55)

More recently, Bernal argued that the pre-eminent reason why the pursuit of science became transformed into a profession in Germany more than elsewhere resided in the capacity of that nation's universities to assimilate the culture of science into their regular academic life. "Science", in his view, "did not so much transform the universities as the universities transform^{<ed>} science." (56)

Ben-David's well-known thesis is that the creativity of German scientists stemmed from the organisation of the universities, which facilitated and produced a complete transformation of the possibilities for scientific careers. (57) The emergence of new bio-medical and scientific disciplines is attributed to the favourable but unintended consequences of a decentralised and 'competitive' academic market situation. Appropriate intellectual opportunities were exploited and requisite facilities created only when scientists, of whom physiologists were prominent representatives in this respect, believed their labour would earn suitable rewards in the form of specialised chairs, well-financed and administered institutes, and remunerative salaries.

The German system of 'Habilitation' (according to which proven ability and achievement in scientific research conferred the right to teach upon a scholar, rather than the reverse) was also important in the structure of the universities. Mobility within the

universities, which comprised nineteen by the 1860s, further facilitated the efforts of each university to achieve its goal of attracting the most productive scholars in their chosen scientific fields.

Thus specific features of the historical development of the universities and the changing structure of the academic market-place fostered a 'competitive' milieu and provided attractive career opportunities which enabled German scientists to mould their occupation into a specialised, regular profession.(58)

These educational changes exerted some impact on German doctors' professional education. It became the official policy of university administrative bodies after 1850 to encourage the separation of the subject of physiology from anatomy - a policy in which they were largely successful. When, in 1876, Billroth published his historical study of the medical sciences in the German Universities, only at Giessen were the professorships of anatomy and physiology still united. Only in Germany was the education of doctors by the mid-nineteenth century in the privileged hands of university scientists rather than medical practitioners.(59)

Insofar as this kind of analysis gives emphasis to the institutional determinants of scientific activity and focusses on the dynamics of the academic market as the key to explaining the vicissitudes and tergiversations in the scientific achievements of

different communities, it remains of value, although there is no reason to accept Ben-David's implicit assumption that the alleged "positive relationship between scientific productivity and academic competition"(60) is either inherent or necessary. As Ben-David has himself observed, the institutional and intellectual advantages of the German system and the image of superiority which impressed foreign observers, obscures a significant 'regressive' effect that transpired, so far as physiology was concerned, after the mid-nineteenth century. Once each university had acquired its independent chair of physiology, innovation and further career opportunities tended to decline; and the continuing buoyancy of the bio-medical sciences in Germany demands explanation in terms of alternative factors such as the strong political support for learning after the Second Reich was established in 1871.(61)

Nor must we lose sight of the critical importance of nationally-specific patterns of investment in support of recognised fields of scientific and medical endeavour; for this makes sense of the contrast between the pronounced individualism of British science symbolised by the solitary microscopist, and the thriving collective ethos of Germany's symbolised, in turn, by teams of research workers employed in her university laboratories.(62)

The principal objection to Ben-David's thesis relates

to his questionable predilection for methodological internalism which denies that German medical scientists were influenced, so far as the production of their scientific theories were concerned, by their social position or their political motivations. Ben-David upholds the pristine model of bureaucratically-organised, professionalised science taking place in a "socially insulated system of higher education." (63) Yet it is quite legitimate to argue that certain peculiarities of German historical development were reflected and expressed in a specifically German style of physiology. Explication of this national style is, pace Ben-David, of great importance as it was evoked and used as an exemplar by a section of English physiologists, many of whom were among the self-styled 'progressives' of T.H.Huxley's circle (64), who sought to professionalise their discipline in conformity with their image of German experience. The physiological method which Huxley and his collaborators broadly endorsed, albeit with certain modifications, was that promulgated during the 1840s by the Berlin group of 'mechanistic' physiological reductionists to whose Procrustean scientific doctrines we now turn.

Discussions of the problem of 'mechanism' and 'vitalism' must necessarily be prefaced by recognition of the status of these terms as theoretical constructs or 'ideal-types': the protean heterogeneity of the historical forms of relationship assumed between these

contrasting physiological doctrines must constantly be borne in mind.(65) Even those who self-consciously identified with extreme positions at one or other end of the vitalist-mechanist polarity might differ profoundly with others who shared broadly similar metaphysical or ontological views when it came to matters of esoteric physiological detail. Many early nineteenth century physiologists propagated an 'immanentist' or 'transcendentalist' view of the nature of life: both conceptions were 'vitalistic', but the discrepancies between them were as important as the similarities in their metaphysical outlook.(66) 'Materialism' too, often embraced a complex variety of doctrinal forms, as suggested by Temkin's well-known distinction between the 'vitalistic materialism' propagated by French physiologists, and the 'mechanistic materialism' of the Germans.(67) It was also possible for those who held aloof from mechanistic philosophy, perhaps for religious or political reasons, to carry out their physiological work in accordance with 'mechanistic' experimental methodology.(68)

With all due cognisance to these provisos it remains viable to focus on the powerful mechanistic thrust of German physiology after the 1840s as an exemplar of a particular national style of activity in the bio-medical sciences.(69) The objective of the '1847' Berlin group was to reconstitute physiology on an unambiguously 'scientific' basis (in the fullest epistemologically-

privileged sense of the term) by explaining vital phenomena purely in terms of physics and chemistry. The group thereby gave a new lease of life to the old Cartesian project of iatromechanism, reformulating it in conformity with the most recent experimental evidence and the strict newly-elaborated tenets of physico-chemical reductionism.(70)

Among the leading members of the Berlin group were Ernst Brücke (1819-1892), Carl Ludwig (1816-1895), Hermann von Helmholtz (1821-1894) and Emil du Bois-Reymond (1818-1896). All these men sought, with varying emphases, to effect a revolution in ontologies by articulating a reductionist science in stark opposition to the romantic 'Naturphilosophie' of the early nineteenth century.(71) This 'Weltanschauung' stood condemned as vacuous, mystifying metaphysics which had too long served as a theological prop to a spurious vitalism.(72)

The notion of a 'vital force' or 'elan vital' unanalysable and unamenable to explanation of a physico-chemical kind was the specific target of the group's assault. Many believed that the neuro-physiological work of Helmholtz and du Bois-Reymond finally ushered out the age-old notion of spirits or subtle fluids coursing through the nerves to its ultimate terminus ad quem. Where predecessors like Liebig had compromised by recognising the existence of a ceaseless interplay between chemical and vital forces,

the Berlin group were insistent on the universal sway of mechanical laws, heralding the dissolution of physiology as such into the sciences of organic physics and chemistry. The basic stance of the reductionists was to retain the notion of 'force' as a fundamental concern of the science of life, but to connect it explicitly with the motion of brute matter.

Physiology, in former times the abiding interest of amateurs or the peripheral concern of some doctors sceptical about the benefits it might confer upon practical medicine, was henceforth to be regarded as an experimental science like the paradigmatic science of physics, which had established the existence of electrical currents in the animal body and had led to the discovery of the law of the conservation and transformation of energy.(73)

Proponents of the scientific word argued that such discoveries provided the basis for a solution to the medical problems posed by the 'therapeutic nihilism' of the French and Austrian clinical schools.(74) The direct utility to practical medicine of pathological physiology linked with experimental pharmacology was to be the watchword of those seeking to transform long-established clinical traditions, and to displace clinicians from their pre-eminent position in the republic of medicine.

It is wholly in keeping with one of the cardinal contentions of the thesis - the significance of tensions between the scientific 'word' and the clinical 'ward' -

that du Bois-Reymond and Helmholtz were among the most self-conscious scientists of their age. In their unequivocal endorsement of vivisectional experimentation as the foundation of true physiological science, they denied the autonomy of clinical culture, repudiated the ontological conception of disease aetiology and despised the vulgarities of medical practice.

By the mid-nineteenth century, German medical education was more extensively scientised than anywhere else in the world. Thus the ideas and principles, the techniques and methodologies of the newly-constituted experimental science of physiology were brought into fructifying articulation with internal medicine and pathology. When Carl Wunderlich's scientific study of temperature changes induced by disease led to the invention and introduction into clinical practice of the thermometer, it was widely seen as giving added credence to the quintessentially physiologic thesis that physico-chemical life processes to whose disordered state 'disease' owed its origin could be measured accurately as constituents of a semiotic biological system whose signs were amenable to objective 'scientific' modes of explanation.(75) The relentlessly physiological answer to Shelley's immortal question 'what is life?', gave an ever more privileged place to experimental investigation of physiological functions of the body.(76) Hence study of reproduction, respiration, internal secretion, metabolism, nervous action and

circulation became increasingly important elements in the medical curriculum as the century progressed. The clinical laboratory attached to a university science department was a concrete embodiment and material expression of the revolt experienced in Germany (and paralleled elsewhere) against morphology and description, and the triumph of the experimental ideal.(77)

In pathology it was, of course, the cell which provided the central resource for the medical education and pedagogy of the period. Cellular theory gave meaning and coherence to much disparate histological research. Studies of cellular structure had originally been the province of botanists in their investigations into the nature of plants. A botanist, Theodor Schwann (1810-1882) and a zoologist, Mathias Schleiden (1804-1881) engaged in intensive microscopical study of cell structure during the 1830s and the 1840s.(78)

The formulation of cell theory crystallised through their efforts: plants, animals, all forms of life were governed by an essentially cellular architectural principle. It is not necessary to refer to the 'mistaken' belief that cells arose from an amorphous protein mass or undifferentiated matrix called 'blastema'; nor to the equally crude thesis that the improvements embodied in the new achromatic microscope enabled histologists to transform their discipline into an accurate science.(79)

As observed in chapter six, more sophisticated microscopical technology only rendered what was revealed by the lens more problematic and more dependent upon contemporary scientific theory to make sense of what was seen. The investigations of Schleiden and Schwann should rather be seen as prefatory to (in a thoroughly non-judgemental sense) and making possible, the application of cellular biology to medical pathology embodied in Rudolf Virchow's "Cellular Pathology" of 1858.(80)

Rudolf Virchow (1821-1902) has an importance in the history of medical education, pathological science and social medicine that can only be adumbrated here.(81) The breadth of his philosophical outlook and the complexity of his scientific views render his magnum opus of 1858 far more difficult to interpret than is conveyed by the customary characterisation of his medical 'Weltanschauung' as 'ontological'. The kernel of his cellular doctrine is encapsulated in the famous dictum 'omnis cellula a cellula' according to which cellular life could only develop from pre-existing cells. The earlier thesis that cells could originate and germinate de novo from acellular blastemae thus stood — confuted.

The cell, in Virchow's conception, was not only made the ultimate morphological unit within which life could exist, but also the ultimate unit of disease.(82) Yet despite the markedly anatomical connotations of the term

'morphological', Virchow's pathological treatise was not restricted by a framework which gave priority to structural change alone. Virchow argued the cell was "the locus to which the action of the chemical matter <was> bound, and only within its limits <could> that power of action justifying the name of life be maintained"; but within that locus, "mechanical matter <was> active - active according to physical and chemical laws." (83) The chemical and physical investigations of the physiological reductionists were brought to bear by Virchow on medicine's abiding preoccupation with pathology.

Virchow's scientific beliefs underwent clear intellectual development; but the positivist interpretation that his later cellular investigations grounded on observation and experiment stand apart from, and effectively confute, what one historian has referred to as "the murkier speculations of the Nature-philosophers" (84), cannot be sustained. Virchow himself confessed to being a 'vitalist' of sorts, drawing a distinction between 'old' and 'new' vitalism. The representation of disease as an abnormality of the life process originated in the 'speculations' of German nature-philosophers and natural historians of disease in the late eighteenth century: a residue of these older philosophical doctrines is discernible in Virchow's conception of the essential unity of disease patterns in cellular pathology.

Social and political dimensions of German cellular biology may also be elucidated. Virchow himself often sought to bring out the full meaning of the cell theory he propounded by drawing analogies between biological and social organisms. The organismic metaphor has often been studied in relation to conservative social and political doctrine (85), but Virchow's activities as a radical politician, the explicit comparison he drew between cells and the individuals who inhabited nation-states, and the abundant references he made to organisms as 'cell-republics' or 'democratic cell states' suggests that there is no necessary correspondence between the use of such a metaphor in biological science and adherence to a particular social or political philosophy, however intrinsic social ideals as such may be to the scientific formation of concepts of life.

Common cytological terms such as 'cell territories', 'cultures', 'colonies', 'commonwealth', 'migration' and the 'division of labour' inherently evoke and reflect social and political concepts, but they may be used in different historical contexts and periods to advance a complex heterogeneity of social and political interests and causes. Virchow's use of these terms and metaphors reflected his commitment to a relatively democratic and egalitarian political 'Weltanschauung', but one of his contemporaries, Ernst Haeckel, later deployed similar cytological terminology in support of a more hierarchical

conception of the social order, in which cells were analogised to law-abiding citizens in an orderly 'Kulturstaat'.(86)

The socially privileged position of those who taught medical students at German Universities conduced to the adoption of cytology as a guiding thematic core of their pedagogy. Cell theory furnished medical faculties with a common theoretical basis for experimental medicine uniting the disparate sciences of anatomy, botany, zoology and physiology into the kind of coherent paradigm that has often facilitated the formidable task of organising a programme of medical studies. Organicist views, exemplified by Virchow's cellular pathology and the cytological theory of his contemporaries were, in part, generated and sustained by pedagogical demands and the social interests of the professorial community.(87)

In a penetrating reinterpretation of the relationship between German biological concepts and different social groups in Germany during the late nineteenth century, Weindling has complained that

"the relationship between organicist ideology and the social structure of Imperial Germany has frequently been reduced to doctrines of the survival of the fittest as expressing aristocratic and militarist interests, rather than seeing organicist theories as also a product of the commercial middle class."(88)

Members of the commercial middle class increasingly filled professorial positions in university medical faculties, and also grew steadily as a proportion of

those gaining admission to medical schools during a period when the social influence and status of the medical profession gained strategic weight in German society. The dominance of scientific cytology on the medical curriculum may be comprehended as a facet of German nationalism, a response of the middle class to this pervasive political reality of the Imperial German State.(89)

Something of the uniqueness of Teutonic nationality and its undoubted bearing on the medical education of that nation was evoked by Lange in his prescient observation that

"Germany <was> the only country in the world where the apothecary <could not> make up a prescription without being conscious of the relation of his activity to the constitution of the universe."(90)

It would be remarkable if Germany's physicians and surgeons received their professional education immune from the shaping influence of so formidable and stark a nationalist tradition.

Aristocratic surgeon Billroth espoused nationalism almost to the point of chauvinism and xenophobia towards non-German peoples. In his "Lehren und Lernen der Medicinischen Wissenschaften" he bewailed the fact that Germany's material possessions of national wealth bore "no adequate relation" to the nation's striving for culture, somewhat incongruously complaining of Germany's poverty in comparison with France, Holland, Belgium and England.(91) Hand in hand with this uncompromising

national patriotism went a thoroughgoing social Darwinism: health depended "more on heredity than on other social conditions"; overpopulation and increased competition were Germany's "worst enemies"; it did "no harm if epidemics and wars annually <took> their liberal toll of the population."(92)

Puschmann was more sophisticated and less chauvinistic, but clearly took pride in concluding his discussion of the historical development of medical education in Germany with the observation that the German system presented "so many advantages that it justly serve<d> as a pattern which other lands <were> glad to imitate."(93)

The foundation of the professional image and the particular character of Germany's medical education are largely traceable to the institutional development of her university system: the cultural and intellectual prestige invested in her universities; the competitive ethos fostered by her decentralisation; and the fructifying influence of 'Wissenschaftlich' ideology all interacted to nurture, stimulate and sustain the pursuit of institutionalised, state-sanctioned bio-medical science. The activity of the German state at national and municipal level favoured German medical scientists' accomplishment of the historic project of professionalisation. German doctors benefited from governmental recognition of the value of medicine for state (military) aggrandisement; from the furtherance of

an interest in social control; and from industry's receptivity to the utilitarian and economic applications of bio-medical science. Finally, the cytological basis of medical pedagogy was, in part, an expression of the nationalist sentiments of middle-class social groups who gained increasing hold over German medicine.

Professionalist ambitions, intellectual traditions, dramatic institutional developments, investment of financial resources, the energy of teams of medical scientists working in laboratories, and the existence of nationalist traditions deeply embedded in German culture and emboldened by middle-class accommodation to imperialism in the Wilhelmine period all worked to imbue Germany's medical education with its distinctive character.

Education in Experimental Medicine in Victorian England.

Throughout the Victorian period, critics dissatisfied with the status quo in respect of English medical education alluded vociferously to the experience of Germany as a model or exemplar of what could be achieved under more favourable social, economic and political circumstances. The initial burgeoning of the professional opportunities available to German life-scientists consequent upon the Humboldtian educational reforms was followed, as argued earlier, by a period of contraction and decline.(94) Yet more important than this real worsening of German physiologists' professional opportunities, was the image

elsewhere of Germany as a veritable haven for a vast range of scientific and medical research and, in particular, the perception in England of Germany's medical profession as a highly esteemed and valued social group, recognised as such by the state and consequently the receptacle of a whole range of benefits and privileges - institutional support, the investment of financial resources, and professional status and rewards. The goal of achieving similar benefits and privileges lay behind English life-scientists' frequent drawing of an invidious comparison between the differential degrees to which science and medicine had become professional occupations in the two countries.

In the 1820s, before the eufunctional consequences of the Humboldtian reforms were apparent, those canvassing for radical change in the organisation and structure of English medical education were already looking to Germany as a 'progressive' example with which to contrast and berate the relative poverty and inefficiency in the English system. In 1827 the 'Lancet' published an article "On Medical Education in the German Universities" which explicitly underlined the inferiority and insufficiency of English medical education. Particular facets of the German system were highly commended: the abundant provision of chemical and physical laboratories, lecture rooms, anatomical, zoological and mineralogical collections, and libraries "in virtually every university" in the country; the high

quality of lectures in comparative anatomy and pathology (valuably divided into 'general' and 'special' pathology); the separation of physiology as a subject distinct from anatomy; and the effectiveness of clinical teaching which led the neophyte "into the field of observation ... from theory to practice."(95)

Reflecting the prestige accorded to clinical medicine and its essential basis in practical dissection and bedside experience, the editors drew their readership's attention most emphatically to the contrast between

"the care and diligence with which the German professors watch<ed> over the progress of their pupils and gradually initiate<d> them into the practice of their profession at the bedside of the patient, and the manner in which most of our English professors perambulate<d> the hospital wards with a score of breathless pupils at their tails."(96)

Later in the century, however, it was less Germany's clinical education than her state-supported, university-based laboratory research-schools which had become the object of English life-scientists' most jealous veneration. E. Ray Lankester, labouring under adverse circumstances to promote the study of the bio-medical sciences on an experimental and vivisectional basis at the University of Oxford, gave a lecture in 1878 in which he explicitly contrasted the typical German university with its English counterpart:

"<s>tudents sometimes wonder why most of the names in their textbooks are German. The reason is simple enough. The German State Governments expend £600,000 annually on the salaries, laboratories and libraries of

their twenty-one universities."(97)

By contrast, the endowments of the English universities, in Lankester's view, had been "grossly abused" and deflected from their proper objects to the great detriment of higher education in science and medicine.

Lankester underlined the financial and economic factors that underlay marked differences in the quality, character and extent of medical education in the two countries. "The Professor of Pathology at Strasbourg", he enviously observed,

"was offered £1,000 a year to move to Vienna, but the Prussian Government, anxious to keep him, offered to build a new set of laboratories for him at Strasbourg if he would stop and to raise his salary. The new pathological laboratory will cost £50,000. On the other hand, the Government of England, two hundred years ago, handed over the colleges and the Universities of Oxford and Cambridge to the clergy of the Established Church, and the consequence has been that these institutions have ceased to be universities in anything but name."(98)

Hence it had transpired that not a single student of medicine existed at that time in the University of Oxford, and commissioners were debating whether to resuscitate the University's medical faculty. The Regius Professorship of Medicine still existed and carried a stipend of £500 per year, but its present incumbent, Henry Acland, gave no lectures. Lankester did not share Acland's controversial view that Oxford's medical faculty should not become a 'complete' medical school because it was too small a city to supply enough clinical cases. Lankester typically evoked the example

of Germany claiming that Oxford was "more populous than several German towns which possess<ed> celebrated and active medical faculties, such as Heidelberg, Bonn, Gottingen and Jena."(99)

Lankester was by no means alone among English life-scientists in bitterly bewailing the circumstances which denied them the professional opportunities and rewards they believed their German counterparts enjoyed in abundance. John Morgan, Professor of Medicine at Owen's College and Physician to the Manchester Infirmary, rhetorically posed the question in 1875 "why English universities were so little frequented by disciples of Galen and Sydenham?"(100), castigating these institutions as suitable only for those whose minds were given to thoughts of scholarship, theology, history and philosophy, not for the serious study of Anatomy, Surgery, Physiology, or Medicine. Germany's scientific attainments, in Morgan's view, represented a conspicuous contrast with the state of affairs in England: he firmly believed that

"few familiar with the work done in German laboratories in the last twenty years <would> not admit that in the more scientific departments of medicine the leading German Professors <were> both in numbers and in erudition incomparably superior to the men trained at our own universities."(101)

Morgan correctly observed that it was only in the clinical departments of medicine that his own country could sustain any claim to eminence; continental medical

investigations were more delicate and elaborate, and directed to the elucidation of pathology and physiology. In his estimation, the original experimental enquiries carried out in Germany in the medical sciences had "completely transformed both the method of teaching and the knowledge on which such teaching <was> based." The German system of medical education was simply "exemplary" and doctors in England should be trained in an identical fashion.(102)

Some variant of this basic argument - that Germany possessed the world's leading medical scientists because of its thriving, generously patronised national system of higher education - was reiterated with great aplomb by Britain's aggrieved life-scientists whose chosen profession appeared to earn them, as Huxley once notoriously complained, "great distinction, but not bread."(103) Although the polemical purposes served by such arguments conduced to a hyperbolic view of the professional advantages enjoyed by German medical men, the belief was real enough and was based on an accurate grasp of the far-reaching consequences of continental universities' receipt of government aid, central direction(104), and of the more intimate relationship forged abroad between the professions and the state.(105)

Many of Britain's leading physiologists of the mid-Victorian period were able to speak with some authority on the advantages of the German system as they

had spent a number of years in post-graduate training at German Universities. E.A.Schafer, Walter Gaskell, V.Horsley and E.Ray Lankester among others engaged in advanced scientific study in Germany, while some, like Michael Foster, visited German laboratories and were extensively acquainted with the experimental methods cultivated and developed there, without formally registering for post-graduate study. Many of those trained in German laboratory schools or, like J.S.Burdon-Sanderson and William Rutherford, educated in the French vivisectional and experimental tradition of Magendie and Bernard, returned to England formally committed to, and eager proselytisers for, the principles of the new physiology.(106)

As Burdon-Sanderson affirmed in 1893 in an analysis of the origin and meaning of biological science, it was to the experimentalists and physico-chemical reductionists of the continent that physiology owed its status as a mature science:

"<w>e accord to Muller and to his successors Brucke, du Bois-Reymond, Helmholtz, who were his pupils, and Ludwig in Germany and to Claude Bernard in France, the titles and founders of our science."(107)

More specifically, Burdon-Sanderson referred to concrete exemplars of the achievements of the new science: Mayer's demonstration of the principle of the conservation of energy and its application to organic processes; Bernard's research on the chemical dimensions of the principle; du Bois-Reymond's work on the

electro-dynamics of biological organisms; and Ludwig's experimental demonstration of the hydraulic principles of circulation. In sum, these momentous scientific accomplishments had, in Burdon-Sanderson's view, effected "a complete revolution in the ways of thinking and speaking about the phenomena of life." (108)

Although the principal dramatis personae responsible for effecting this radical peripeteia in the bio-medical sciences were French and German, other British scientists fervently joined Burdon-Sanderson in striving to accomplish a greatly-enhanced role for the laboratory sciences in the education of doctors, and, its ultimate corollary, more extensive employment opportunities which would lead to the establishment of a genuine physiological profession in England. Among growing numbers of England's able and energetic biological scientists whose ultimate goal was the transformation of their science, conceived as quintessentially experimental, into a profession broadly modelled on the continental example, T.H.Huxley may be singled out as a particularly prominent and important representative. Huxley held strong views about the future direction, scope, curricular components and organisation of medical education, which revolved around his uncompromising endorsement and advocacy of laboratory-based experimental research in the bio-medical sciences. The powerful position occupied by Huxley, unquestionably a leading member of the scientific elite, gave inevitable

prominence and weight to his views, which, in sum, amounted to an unequivocal demand to restructure the whole basis of medical education in conformity to the imperatives of the scientific 'word'.

T.H.Huxley and Victorian Medical Education.

Thomas Henry Huxley (1825-1895), son of a lowly and unsuccessful schoolmaster, became one of the most outstanding polymathic intellectuals - biologist, scientific polemicist, educator, philosopher, and cultural activist - of the Victorian period, whose impact on the social history of medical education was singular and decisive. From inauspicious beginnings as an apprentice at the age of fifteen to a medical practitioner in London's poverty-stricken East End, Huxley went on to secure a free scholarship at Charing Cross Hospital Medical School in Central London where he acquired a reputation as an assiduous student of microscopical science, won several academic prizes, and published a research paper before graduation.(109)

Huxley's meteoric rise after his famous voyage as the assistant-surgeon on HMS Rattlesnake to the very pinnacle of the nascent English scientific profession is well known. The biographical details need not be rehearsed here.(110)

What is important is the manner in which Huxley sought to generalise more universal lessons on the basis of his own personal struggle to become a professional scientist in his chosen field of physiology. As a young

medical student at an institution long to be noted for resilience in its clinical traditions, Huxley developed emphatically scientific research interests centred on the laboratory and experimental methods of investigation: the particular conception of the bio-medical sciences espoused by Huxley and the views he promulgated on the future of medical education were calculated to facilitate more widely the process of 'creaming off' advanced students, like himself, cognisant with the principles and procedures of the new continental sciences of nature (as distinct from medicine's autochthonous clinical ordinances) from the nation's medical schools.

Huxley perhaps more than any other individual scientist of the period was deeply imbued with what A.N.Whitehead once referred to as the "self-conscious realisation of the power of professionalism in knowledge ... and of the boundless possibilities of technical advance." (111) Again we encounter the apparently omnipresent dialectic of knowledge and power. By examining Huxley's views on the identity, provenance and quidditative nature of the life sciences, and his drastic prescriptions for the reform of medical education, we shall see another detailed instance of how the tortuous playing out of this complex dialectic revolved around the process of professionalisation.

What were the principal elements of Huxley's overall conception of the biological sciences, insofar as it is

possible or legitimate to identify them?(112) Answering this question is tantamount to specifying Huxley's notoriously explicit and single-minded answer to the essential question of biology - what is life? Huxley earned a deserved reputation as one of the most articulate exponents of the view that life could never be explained satisfactorily in terms of form or structure, however systematically or with whatever degree of complexity these dimensions were studied. To an earlier generation who sought explanations for life in a synthetic 'science of organisation' which united morbid anatomy, comparative anatomy and physiology under teleological principles(113), Huxley counterposed the thesis that life was a function of substance and that the semiotics of its Orphic complexities could be accurately read only by those acquainted with the principles and methods of an autonomous experimental physiology. It was in support of an essentially substantialist view of life that Huxley announced to the world in 1854 that physiology had become

"the experimental science 'par excellence' of all sciences; that in which there <was> least to be learnt by mere observation, and that which afford<ed> the greatest field for the exercise of those faculties which characterise<d> the experimental philosopher."(114)

Such an explicit attempt to accomplish a fundamental epistemic shift in the bio-medical sciences from a problematic of observation to a problematic of experimentation had the effect of underlining the

underdetermination of physiological explanation of the phenomena of life by anatomical or structural inferences. Indeed, the procedure of deriving the former in the manner of Bichat from observation of the latter as revealed at autopsy was, stricly speaking, a non sequitur which stood condemned as 'unscientific'. Huxley was anxious to differentiate valid physiological explanation as unambiguously as possible from previous modes of reasoning either anatomical or histological. Whilst these former disciplines had their value in providing a transitionary matrix out of which experimental physiology had germinated, they had now reached their historic terminus ad quem and become redundant.(115)

Henceforth it was necessary to insist, in Huxley's opinion, that all forms of anatomical explanation were inherently incapable of shedding 'scientific' light on physiological phenomena. For the prospective doctor, this quintessentially physiologic thesis had profound implications: disease could not be understood, let alone combatted, on the basis of knowledge of what - anatomically - its existence in the body betokened; rather it was imperative to understand precisely how - physiologically - disease operated within the body in order to combat its mischievous workings.(116)

As Huxley clarified in a series of publications, this radically, exclusively physiological conception of pathology amounted (in conjunction with his espousal of

the related doctrines of scientific naturalism, physicalism and reductionism) to a demand for the education of doctors to be centred upon practical heuristic instruction in the basic sciences of physics and chemistry as applied to medicine. A latter-day iatro-physicist and iatro-chemist, Huxley defined physiology simply as "the application of the principles of Physics and Chemistry to the elucidation of the phaenomena of life"(117), and looked back to Descartes as the originator of modern biology. In a discussion of animal automatism in 1874, Huxley explained that

"Descartes did for physiology of motion and sensation that which Harvey had done for the circulation of the blood and opened up a road to the mechanical theory of these processes which <had> been followed by all his successors"(118)

Huxley's own biological researches were aggressively located in that same mechanistic tradition, and were intended to suggest that physiologists in their capacity as modern biological scientists need have no recourse to any teleological doctrine of 'final causes', nor to the hypostatisation of discredited Aristotelian entelechies in seeking to define and give meaning to life. So unqualified were some of Huxley's pronouncements on the character of science and the nature of life that some commentators, including Lenin, believed him to be a proponent of thorough-going deterministic materialism.(119) Such an exegetical interpretation unfairly glosses over Huxley's distance from identifying

with so crude a philosophical position, but few have ever doubted his broad sympathies with mechanistic traditions of thought.

In a famous address to an Edinburgh audience in 1868, Huxley proclaimed the irreducibly physical basis of life and insisted that all genuine progress in the sciences had been the result of

"the extension of the province of what we call matter and causation, and the concomitant gradual banishment from all regions of human thought of what we call spirit and spontaneity."(120)

His principal object in enunciating such a maxim was to urge that all life forces - including, critically, consciousness - could be studied, examined, quantified, and accounted for by an unambiguously physical standpoint. That 'life' as such was simply part of a physical unity, Huxley held to be a fundamental axiom of existence, an uncontrovertible fact stemming from the operation of the laws of a new Nature begotten by science.(121)

In this way, Huxley sought to invalidate and render impertinent the stubbornly persistent issues of vitalism, and to confound critics who continued to invoke the existence of a distinctive and extraneous life force, by his obdurate repudiation of any dynamic operational in the living organism other than that of physics and chemistry.(122) The study of the biological sciences as conceived by Huxley was but the study (according to those same known laws of physics and

chemistry) of physical mechanism under highly complex circumstances.

Reductionism and naturalism went hand in hand as the proper explanatory bases of true physiological science. The former refers to the process whereby theories devised to explain phenomena coming within the range of one science are applied within the range of another, i.e. Huxley's physico-chemical reductionism which necessitated studying biological organisms as 'living machines in action'.(123) The latter was a cosmological scheme characterised by hostility to supernatural or teleological explanations of natural events, adherence to a doctrine of justification by empirical verification, and positive assertion of the claims of the jurisdiction of science in every part of knowledge and experience.(124) Huxley's energetic activity as quodlibetical compurgator for the cause of a thoroughly naturalistic biology, though part of a wider strategy of shifting scientific culture from a peripheral and marginal role in English life to a central and commanding one, was expressly directed at a medical audience in full cognisance of the benefits patronage still had the capacity to confer in the mid-Victorian period.

In 1876 and 1881 Huxley wrote two treatises on the new relationship forged between medicine and its basic biological sciences. The latter amounted to a manifesto for the progressive scientific professionalisation of

medicine, which betokened a fundamental transformation of the curriculum, material organisation and pedagogical orientation of medical education.

In the first, Huxley traced the origins of biology as distinct from natural history to the writings of Bichat, Lamarck and Treviranus in the early years of the nineteenth century. He was particularly concerned to emphasise the real scientific achievements of modern biology which, in his view, consisted in the demonstration that a 'fundamental uniformity' of structure and function pervaded the animal, vegetable and, ultimately, human world alike, rendering man's nature and faculties no different in kind from those of the lower animals.(125)

In the second, Huxley's polemicism was directed most emphatically to those circles in the medical world who remained sceptical of the practical therapeutic value of experimental physiology and the whole paraphernalia of the laboratory to medicine's customary clinical objectives. Huxley's brief was to quell such misconceptions and dispel any doubt as to the direct, immediate, and utilitarian relevance of the neo-Cartesian mode of physiology to the 'realities' of clinical pathological medicine.

Huxley's starting-point was that though medicine was commonly represented as something "necessarily connected with curative treatment", it was too often overlooked that there must be, and was, a 'pure science' of

medicine and pathology which had "no more necessary subservience to practical ends than <had> zoology or botany."(126) From the outset, Huxley was here throwing down an unmistakeable challenge to the old elite who conceived of medicine as an erudite art suitable for cultured gentlemen charged with the moral responsibility for curing the sick man. Unlike those who looked to the history of medicine in western civilisation for confirmation of the ineffable autonomy of physic from its basic and collateral sciences(127), Huxley examined the same past, traced the emancipation of medical scientia from its crude empirical heritage, and drew diametrically opposite conclusions.

By collapsing any line of demarcation between 'normal' and 'pathological' phenomena, Huxley stood the conventional clinical wisdom on its head in the bold declaration that therapeutic progress had been the consequence of the extension and the incorporation into medical research and practice of advances in the bio-medical sciences. So far from the essence of pathology residing in some hypothetical, hermetically-sealed compartment accessible only to the experienced erudite clinician clothed in the mantle of Aesculapius, pathology was, in the Huxleyite conception, simply "a branch of biology; it <was> the morphology, the physiology, the distribution, the aetiology of abnormal life."(128) The genuinely scientific character of modern pathology was attributed directly to the

maturation, only recently attained to a 'degree of perfection', of the science of physiology itself. This accomplishment was made possible by the Herculean effort of post-Cartesian physiologists to resist and counter animistic hypotheses and animistic thought - the asylum ignorantiae of medical science - with the enunciation of explicitly and exclusively physicalist explanations.(129)

Given Huxley's premise that living matter differed from other forms of matter only in degree rather than kind, and that the long-hallowed realm of 'the vital' was revealed by modern science to consist in "nothing but changes of place of particles of matter"(130), what lessons might the student physician extrapolate and apply to the practice of his profession? Huxley's argument was to redefine, relocate and reconceptualise, for the benefit of aspiring doctors, the elusive character of disease in terms concordant with the radically physiological 'Weltanschauung'. Insistence upon the universal applicability and critical relevance of this 'gestalt' to medicine was the primary polemical purpose Huxley sought to advance by these formulations.

It should be recalled that since Sydenham the prevalent tendency of clinicians had been to presuppose that diseases were discrete species existent in nature, ontologically real entities whose regular onset and constant symptomatology bore witness to their 'reality' and furnished physicians with their major field of

study.(131) Huxley's conception of disease was quite different. His basic stance was to analogise the body as a machine (more in the sense of an army than a watch or hydraulic apparatus) and to view diseases as derangements of the physiological units of the body or their co-ordinating machinery. The future of pathology, therapeutics and practical medicine, ex hypothesi, lay with the scientific discovery of the precise workings of such physiological derangements, and the effective alteration of pathological conditions to redress the derangement without disturbing the rest of the body.

"Henceforward", Huxley proclaimed in 1881,

"the connection of medicine with the biological sciences <was> clearly indicated. Pure pathology <was> that branch of biology which define<d> the particular perturbation of cell life, or of the co-ordinating machinery, or of both, on which the phenomena of disease depend<ed>."(132)

Huxley's proposed 'solution' to the problems consequent upon the supposed 'therapeutic nihilism' of the early nineteenth century clinical schools(133) amounted to the extension of experimental investigation into the molecular mechanisms of living protoplasm.

One clear corollary of Huxley's pathological views was a greatly enhanced role for pharmaceutical intervention in the practice of therapeutics. The administration of particular drugs relevant to particular diseases was the principal means by which specific organic perturbations in the physiological process of the body might be rectified and restored to

their normal state of homeostatic balance. This is another way of drawing attention to the increasing emphasis attached by Huxley and his circle to the chemical constitution of living organisms and, ipso facto, to the growing importance of the science of organic chemistry as a subject on the medical curriculum. Where earlier commentators such as Todd and Bowman included discussion of the chemical constituents of the body in their widely-used textbooks, the guiding assumptions of anatomical physiology effectively circumscribed chemical analysis within the parameters of structural explanation.(134)

By contrast, Huxley and his sympathisers allotted the organic chemistry of function a primary role in the new physiology whereby animal life and bodily functions were regarded, as Burdon-Sanderson affirmed in 1879, as "an aggregate of chemical processes for which food and oxygen afford<ed> materials, the products being heat, muscular action, carbonic anhydride, water and ammonia."(135)

Proponents of the marriage of physiology and organic chemistry under a broad medical church, sought to vindicate the potential therapeutic value of these sciences in shedding light upon the mysterious properties of illness and disease. Thus a scientific construct such as Baume's chemical nosology, which classified diseases in accordance with the properties of four quaternary compounds (oxygeneses, calorineses,

hydrogeneses and azoteneses) carried with it clear diagnostic and therapeutic prescriptions. Diseases were the product of a faulty balance between the four elements; restoration of that balance would eliminate them.(136)

Unfortunately for Huxley and like-minded physiologists, it was notoriously difficult to cite specific concrete examples of the supposed therapeutic benefits conferred by the experimental life sciences on practical medicine. Some were sanguine about this state of affairs. As late as 1870, Rogers frankly admitted in a study of pathology and therapeutics that "we have really no principles of therapeutics."(137) Similarly, a reviewer of the British and Foreign Medico-Chirurgical Review concluded a discussion of eleven books on therapeutics and materia medica with the observation that "everyone seem(ed) ready to admit <that> the whole subject of therapeutics <was> in a most unsatisfactory state ..."(138)

Huxley was determined to scotch all such mawkish pessimism concerning the Promethean therapeutic potential of experimental science. He confidently asserted that the ineluctable progress of the bio-medical sciences during the last forty years left

"no ground for doubting that sooner or later the pharmacologist <would> supply the physician with the means of effecting, in any desired sense, the functions of any physiological element of the body."(139)

The undeniable achievements of those years - represented

by a new awareness that the explanation for disease should be sought via the study of modified cell life; recognition of the determinate role of parasitic organisms in the aetiology of disease; and enhanced understanding of the physico-chemical workings of medicaments administered to counter it - were, for Huxley, "the greatest steps which <had> ever been made towards the establishment of medicine on a scientific basis"(140), and had been the consequence of path-breaking advances in normal biology. The immense gap between Huxley's inflated rhetorical predictions and the real potential (judged on the basis of available evidence) of experimental pharmacology's capacity to transform pathology into a eufunctional praxis was a testament to the polemical context in which Huxley enunciated such utterances - a context in which convincing those responsible for the organisation of medical education of the overall value of science was perceived as the most effective means of advancing and extending the professional opportunities available to life scientists in an unfavourable social and intellectual milieu.

The experience and example of Germany was, of course, a critical factor in influencing Huxley's opinions in a number of respects. Huxley's own scientific work was deeply indebted to German science with its emphasis on embryology, morphology, and typological thinking - perhaps Huxley was as much the 'bulldog' of Johannes

Muller, Karl Ernst von Baer and Ernst Haeckel as of Darwin.(141) Huxley was also acutely aware that the financial relations of state and scholarship in Germany had conferred occupational security, high prestige and stable career opportunities on which to base a fully professional scientific community with accepted research commitment.(142)

Towards the end of his life in 1892 Huxley was still bemoaning the fact that the English Universities remained sui generis vis-a-vis their continental competitors. He reserved his greatest contempt for Oxford and Cambridge, still at the end of the nineteenth century essentially 'hauts lycees' or finishing schools serving the needs of a powerful but limited class of English society.(143) The superiority of German universities was never in doubt: "the French University <had> no liberty, and the English Universities no science: the German Universities <had> both."(144) Above all, cities such as Berlin, Vienna and Leipzig possessed physiological laboratories which had developed as institutional outgrowths of medical schools: their very existence symbolised the more intimate relationship that obtained in Germany between science and medicine.(145) Huxley's prescriptions for the reform of English medical education were put forward to foster and promote a comparably symbiotic relationship minimising the discrepancy between the professional opportunities open to English and German life scientists.

The practical recommendations Huxley advanced to modernise English medical education were in some ways quite prosaic. Reflecting the phenomenal expansion of bio-medical research during the nineteenth century and the increasing pace of specialisation within it, Huxley took the view that a drastic pruning of the curriculum was demanded. Medical students' training was limited to four years; only those subjects with the most direct scientific and practical relevance to the profession of medicine could be justified. In his famous rectorial address of 1874 to the University of Aberdeen, Huxley sketched a framework for remodelling the medical curriculum: the student should devote the first two years exclusively to anatomy and physiology (taught in a practical fashion as applied physics and chemistry); thereafter, his whole mind should be devoted to 'Therapeutics in the broadest sense' including Pathology Practical Medicine and Surgery, Hygiene, and Medical Jurisprudence.(146)

The corollary of this rigorous application of the criterion of relevance was that extraneous subjects must be discarded from the curriculum in order to relieve it of "everything which <did> not directly tend to prepare the student for the discharge of those highly responsible duties" demanded of the doctor.(147) Comparative Anatomy and Histology (both effectively 'sciences of yesterday') should be 'absolutely abolished' as subjects worthy of the serious attention

of student physicians. Botany and Zoology, seen as too remote from the practical concerns of a healing profession, were also to be expunged from the curriculum.(148)

Huxley took pains not to deny the educational value of these subjects as disciplines in their own right; their exclusion from the curriculum was demanded in protest against the employment of medical students' energies on the acquisition of any knowledge not critically relevant to the conduct of their future careers. In effect, Huxley was adopting the principle of the division of labour articulated by Adam Smith and revered by Victorian political economists as essential to material progress. Comparable progress in medical education, Huxley insisted, was dependent upon recognition of the 'necessity' of this principle.(149)

One final aspect of Huxley's beliefs must be discussed before tying together the different threads of our analysis of the Huxleyite vision of medical education. Huxley earned a notorious reputation as scourge of the clerical establishment, and an uncompromising critic of all theologically-inspired attempts to fashion and mould scientific representations of nature in conformity with Biblical exegesis. Although one of Huxley's biographers has sought to question the emphasis on this Victorian scientist as an agnostic avatar 'sacerdos semper ubique et omnibus inimicus', it is undeniable that smiting the Amalekites and

excoriating the numinous authority of the clergy were among the primary self-confessed objectives of Huxley's professional career.(150) Indeed it is possible to see Huxley and his coterie's scientific naturalism as an intellectual outlook espoused and propagated as part of a strategy intended to advance the thwarted professional aspirations of England's disadvantaged life-scientists in a society not yet by the mid-Victorian period at advanced stage of secularisation. Indeed, the cultural and ideological power of the clergy, to say nothing of its substantial wealth, remained impressively disproportionate.(151)

In our earlier discussion of 'quackery', we observed how incumbents of occupational roles undergoing the process of professionalisation frequently engaged in conflict with outsiders who threatened to undermine the claim of the former to exclusive status and rewards on the basis of their special expertise. It is evident that clergymen, as well as various types of 'quack' practitioner, were regarded as hostile outsiders unjustly denying those life-scientists whose interests were articulated and championed by Huxley access to the professional benefits which they saw as their rightful possession.(152) Most irksome and offensive of all from the standpoint of the latter (and here we touch something which groups as apparently dissimilar as priests and homeopaths shared in common) was the fact that the social status sought by medical scientists on

the basis of their education and training was being usurped by competitors peddling fragrantly 'sham', 'spurious' and 'perfidious' knowledge.

In this light, the appeal of the naturalist cosmology to the eminent scientists of Huxley's circle is apparent. As Turner has argued in a trenchant sociological analysis of the Victorian conflict between science and religion,

"y claiming their own epistemology as the exclusive foundation for legitimate science and the correct model for knowledge generally, the professionalising scientists sought to undermine the intellectual legitimacy of alternative modes of scientific thought and practice. Positivist epistemology provided an intellectual solvent to cleanse contemporary science of metaphysical and theological survivals."(153)

This cleansing process was not merely a matter of debating abstract metaphysical ideas: positivism, phenomenism and the naturalistic cosmology were advanced as part of a professionalist strategy aimed at securing a redistribution of wealth and power in favour of the new professional middle-class of Victorian society.(154)

We have seen that the philosophical assumptions espoused by Huxley led in practice to prescribing a greatly enhanced role for organic chemistry on the medical curriculum. When, in 1870, Huxley was asked for his advice on updating that curriculum for UCL's medical students, he recommended focussing on the chemistry of tissues, of food, blood and lymph fluids, and excreta;

he also suggested giving priority to the general nature of digestion and the physical and chemical processes of respiration.(155) These intellectual preferences and curricular prescriptions entailed far-reaching consequences: only in the laboratory - the locus classicus of experimental science - could medical education conceived on the Huxleyite model be prosecuted effectively. Institutional and intellectual imperatives were inextricably intertwined, and both demanded the investment of resources drawing attention once more to the uneasy relationship between governments and scientists in the Victorian period.

It remains to observe that T.H.Huxley was not only extremely knowledgeable about the whole gamut of problems surrounding the conduct of medical education (having experienced it first-hand in his youth) but also a highly competent and proficient lecturer who taught at St.Thomas' Hospital Medical School and was Hunterian Professor of the College of Surgeons as well as Director of affairs at the South Kensington Complex.(156) For more than a decade Huxley was employed as an official examiner at the University of London, in which capacity he earned a reputation for maintaining high standards and effecting various curricular reforms.

In 1870, the RCS instituted an important reform which obliged all candidates for its professional examinations to attend a variety of specifically practical courses in general anatomy and physiology. Geison's contention that

Propagation of the Scientific Word: The Pedagogy of Laboratory Medicine.

If Huxley was the most extreme and powerful spokesman for the scientific word, we must now examine some of the pedagogical discourse of others who broadly shared his commitment to reconstructing medicine around the basic sciences, and making experiment the ultimate arbiter of bio-medical disputation and the axis around which practical therapeutics should be conducted.(160) In the previous chapter it was argued that the pedagogy of clinical medicine could not be analysed or explained by an a-historical form of discourse analysis centring on the hermeneutic explication of autonomous forms of talk. Similarly, I here contend that contextualist historicisation which renders conceptually central factors such as the professional interests of bio-medical scientists, the growing importance of the laboratory as an institutional setting, and wider socio-economic and political developments is necessary in order to explain, in the fullest sense, the historical meaning of the pedagogical principles under discussion.

Although the focus here is principally on English proponents of the scientific reform of medical education, the international context of these developments must not be forgotten. Claude Bernard of France and Rudolf Virchow in Germany articulated the interests of many who sought to capitalise on their

this statutory change represented "the single most important factor in the transformation of late Victorian physiology"(157) appears hyperbolic and need not be accepted. Yet others, including Bellot(158), have also suggested that the efforts of Darwin's bulldog (probably in tandem with Michael Foster and George Humphry of Cambridge) did indeed precipitate this significant reform, which reinforces the overall picture of Huxley's disproportionate role as an individual actor in our social history of medical education.(159)

Finally, to square the hermeneutic circle as it were, Huxley's position as medical educator and examiner connects up directly with our account of his philosophical agnosticism and anti-clericalism. For Huxley saw his responsibilities for overseeing medical education as a means of disseminating the new 'scientific' spirit in biology, and an opportunity for keeping control over the training of doctors squarely out of clerical hands. The circle is complete. Huxley's vision of medical education and the activity he engaged in to transform it was in almost all respects that of an archetypal scientific professional emboldened by a Messianic zeal for the potential which a fully scientised system of training might yet realise. In the eyes of many traditional clinicians whose views were outlined in the previous chapter, Huxley's positivist views were hubris of the most arrogant and dangerous kind.

principal claim that physiologists were potentially the best, not the worst, doctors.(161) In the USA, a powerful reform movement existed which was to culminate in the Flexner Report of 1910. Appeal to the cognitive potency of scientific culture was the primary ideological strategy developed by the movement's principal beneficiaries - self-styled 'regular' doctors preoccupied, like their English counterparts, with combatting homeopaths and other potentially subversive alternative medical sects. Of course, the trajectory of the French, German and American reform movements was not identical, as particular features which were a function of each society's specific historical development are identifiable. However, it is manifestly clear that the cultural antagonism between traditional clinicians and proponents of the scientific renewal of medical education was not confined to England, nor any other specific nation-state. The following discussion is largely confined to English medical education.

English scientists earning their living by teaching students the methods of experimental science in institutions of medical education (increasingly the university as the century progressed) proved no less resourceful nor polemical than their clinical counterparts in conveying implicit pedagogies in the lecture-theatre; but their meanings were encoded in a vocabulary of a different order, spelt not in the letters of 'clinical experience' but of 'rational

science'. For all their profound differences and mutual antagonisms each of the rival communities agreed that the cluster of knowledge, skills and practices it possessed (to the exclusion of the other) represented an equally privileged mode of human cognition. On the strategic indispensability to modern society of the services which possession of the relevant expertise conferred upon those schooled in the appropriate rituals, spokesmen for each sub-group were at one. Yet such was the scope of intra-professional enmity that advocates of the claims of either community defined themselves as members of a distinct self-conscious group in opposition to their rivals, and propagated a form of medical pedagogy in conscious opposition to their professional adversaries.(162)

Delivering prescriptions for medico-administrative reform before the enactment of legislation in 1858, Alexander Harvey, a Wakleyite radical, propounded a particular conception of the optimum form of medical education which clashed starkly with both the practical heuristic and suspicion for book-medicine commonly encountered in clinicians' prolegomena to medical study. As against overburdening students with 'a mass of detail', Harvey preferred greater emphasis on "that higher kind of instruction the exposition and application of principles wherein lay the charm of the teaching of former days, and wherein must ever lie the real value of professional instruction."(163) Harvey's

remedy for the evils and deficiencies of present practice was "a system of teaching by lectures embracing every branch of medical science" which ought to be obligatory for all students.(164) His advocacy of explicitly book-based pedagogy to provide the theoretical coherence he believed to be absolutely necessary to facilitate students' overall comprehension of medicine went hand in hand with a conception of the subject as an 'art' which was dependent upon (i.e.subordinate to, in the last analysis) scientific principles. "Every practical art", he asserted, was "founded on its appropriate science and the practical art of medicine <was> founded on the science of medicine as its proper basis."(165)

Scientific research on the nature of disease embodied in a text book whose author was conversant with the most recent methods, techniques and findings of the laboratory was a prescription for the reform of medical education wholly anathema to clinicians schooled in the old traditions. The latter found a formidable adversary in John Hughes Bennett, Professor of the Institutes of Medicine at the University of Edinburgh.(166) A leading 'progressive', Bennett was convinced that systematic scientific research could advance medicine far more rapidly than clinical research into the unique causes of pathological conditions found on fortuitously-provided patients in hospital wards. After graduating at Edinburgh in 1837, Bennett spent four years studying

medical microscopy, clinical medicine and experimental physiology in the state-supported laboratories of Paris and Berlin. He returned to Edinburgh with a burning conviction in the medical value of pathological microscopy and of the experimental techniques he had acquired as a scientific worker on the continent.(167)

How did Bennett's pedagogy compare with clinicians' customary suspicion of scientific rationalism and characteristic emphasis on the essential incompatibility between scientific research and clinical practice?

Bennett enjoined his students in the 1850s to celebrate the arrival and imminent maturation of scientific medicine. He distinguished between the 'exact' sciences such as physics and chemistry, and the 'inexact' such as agriculture. He conceded that medicine had not yet been fully propelled into the ranks of the former, notwithstanding "even the beautiful generalisations of Schleiden and Schwann." Nevertheless, Bennett insisted that physiology and pathology were "advancing with such rapidity that every year revolutionise<d> the ideas which sprang up in the one which preceded it." Giving expression to that physicalism soon to find its apotheosis, as we have seen, in the neo-Cartesian pronouncements of T.H.Huxley, Bennett informed his students that "the branch of science which refer<red> to vital phenomena <bore> such a relation or correlation to various branches of physical science that the whole <was> gradually becoming

more simple instead of more complex", concluding that 'the union of the natural sciences' was ipso facto near at hand.(168) William Cullen, eminent member of the Scottish medical literati was cited in support of the controversial viewpoint that a 'true account of the state of theory' was of immediate relevance to medical practice.(169) Indeed, this Cullenian maxim had assumed even greater significance subsequently because "almost every step" made in the practice of medicine since the Scottish medical renaissance was, in Bennett's opinion, "the result of scientific investigation."(170)

Drawing the familiar distinction between the 'art' and the 'science' of medicine, Bennett self-consciously reversed the hierarchy and prestige more conventionally accorded to them. In the past medicine's art may well have been the dominant partner for just, historical reasons, but science had now emphatically assumed its mantle rendering medicine's art 'a mere slave to her commands'. Clearly with those laudatores temporis acti among the old guard of clinicians in mind, Bennett cautioned neophytes to be wary of reactionary opposition to new techniques and practices such as the microscope and auscultation which had revolutionised medicine. Prolonged opposition to scientific innovations embodied in new technology - the ophthalmoscope, laryngoscope, thermometer, sphygmograph - was a characteristic response of elite clinicians to the threat posed by Bennett and his sympathisers to traditional clinical

power and autonomy.(171) Bennett countered this hostility with the rhetorical question, "<w>hat should we think of a modern astronomer who boasted that it was enough for him to examine the heavens with his naked eye and sneered at telescopes?" Detection and correction of disease was the proper business of medicine, and in prosecuting this objective it was incumbent upon the medical profession to "seize on every means that science place<d> in <its> hands."(172)

The guiding thread of Bennett's address was that practical therapeutics was inextricably linked to the bio-medical sciences in general, and physiology in particular. As he explained more fully in his textbook, the viability of cellular and molecular physiology and pathology had one simple corollary - the viability of cellular and molecular therapeutics. Knowledge of the scientific laws governing the physiological processes and functions of the human body was the precondition of deriving an adequate understanding of pathological conditions on which efficacious therapeutic intervention depended.

The priority he accorded to the infusion of scientific principles - going so far as to revive the goal of building a 'system' of medicine that would 'command the respect of the scientific world' - stood in polar contrast to the anti-systemic, anti-rationalistic and anti-theoretical ideology of the clinical ward's protagonists. Indeed, those aetiological prescriptions

and immutable laws against which clinicians had so forcefully inveighed for having bogged medicine down, as it were, in a Hegelian metaphysical swamp, were elevated by Bennett to lofty status as the precondition of the progress of medicine in both its professional and scientific dimensions.(173)

In full accordance with Bennett's endorsement of the commanding importance of physiological investigation of normal phenomena on the medical curriculum, George Johnson, Lecturer in Physiology at KCL, commended his subject to students as an example of "the legitimate claims of medical science" as against the 'bete noire' of professionalising allopathic physicians - "the impudent demands of pretentious quackery."(174) Dating the origins of modern physiology from Harvey, rightly seen as one of the first physicians to accord systematic experimental investigation a central place in the scheme of medical studies, Johnson paid tribute to its consummation in the work of Claude Bernard and Brown-Sequard on the vaso-motor nerves and insisted that the progress of the discipline during the past twenty-five years had been unprecedented. "<N>one but a physiologist", he insisted, was in a position to

"rightly interpret or fully comprehend the various modes in which disease of one organ excite<d> functional disturbance and even structural change in another ..."(175)

Physiology thus formed the only possible basis on which a scientific pathology might be constructed.

Samuel Solly's address to the students at St. Thomas' Hospital in 1868 revealed that there were dissentient voices among typically clinical-oriented communities stirred by the pace of scientisation and cognisant of the potential benefits, largely of a 'professional' kind, perceived to stem from it. Solly was a Lecturer in Clinical Surgery and prefaced his remarks with the inevitable panegyric on John Hunter and accounted for his genius, which enabled surgery to be raised to 'truly scientific' status, in terms of his unceasing devotion to the study of physiology.(176) Conventional clinical wisdom was stood on its head as Solly insisted that understanding of scientific principles had most contributed to medical advances and, its corollary, increasing estimation on the part of the general public of the medical and surgical professions as worthy to stand in the foremost ranks of Victorian England's stratified society. It was a certain 'habit of reasoning' that Solly most desired to impart to his students. "The widest field of observation, rich in medical phenomena" he declared to be "utterly useless without this habit"; and "the experience of years in the most extensive practice" (the ultimate reference-point and totem of orthodoxy among traditional clinicians) was "vain and valueless to the individual who <had> neglected to acquire it." Practical, first-hand experience of illness at the bedside was giving way to the newly-vaunted rigours of physiological science.

Yet experimental physiologists themselves proved most adept at articulating a veritable barrage of propaganda on behalf of that most 'nouveau riche' and 'parvenu' of Victorian life sciences. William Rutherford, Professor of Physiology at KCL, proved to be one of the most Procrustean compurgators on behalf of medicine conceived as a progressive experimental science on the French and German model. Like Bennett, Rutherford had been trained at Edinburgh and on the continent, where he acquired a staunch commitment to physico-chemical reductionism and vivisectional methods - the central planks in the rallying-cry of those aggressively professionalising, quasi-positivistic experimental physiologists of the Huxleyite camp who sustained their medical pedagogy with uncompromisingly naturalistic resources.

Rutherford's unwavering advocacy of vivisectional experimentation on living animals incurred the vilification of the anti-vivisection movement whose existence in Britain, in tandem with the enduring vitality of natural theology, has long been presented as evidence of the underdeveloped state of British physiology.(178) Anti-vivisectionists convinced of the abuses and serious cruelty involved in Rutherford's research on the secretion of bile successfully campaigned to force him to continue investigations over the channel. For his part, Rutherford joined Huxley in mounting a vigorous defence of vivisection for the further development of the bio-medical sciences, and

subsequently in campaigning against offending clauses of the Act of 1876, which was seen as overly deferential to the anti-vivisectional case, seriously obstructing the future progress of medical research.(179) From the late 1840s onwards, the introduction and successive improvement of techniques of anaesthesia was of critical importance to the fledgeling profession of experimental life scientists, but did little in the short term to stem the tide of anti-vivisectional activity.(180)

As medical educator, Rutherford consistently upheld the quintessentially physiologic standpoint with which self-styled progressives set about reversing the backwardness of English life science. As French has legitimately argued,

"the most important single factor retarding the growth of physiology ... was the inability of physicians and surgeons to recognise its status and value as distinct from anatomy."(181)

Institutional marginalisation, lower professional morale and cohesion, meagre financial rewards, and humble social status had been the consequence of physiology's subordinate position within the peculiarly English hybrid of anatomical physiology. Nothing less than complete reversal of the respective hierarchical pecking-order of the two medical sub-disciplines was the project which Rutherford and like-minded life scientists were determined to accomplish.

In 1869, Rutherford informed King's medical students that human physiology was based upon "a tripod

consisting of Anatomy, Chemistry and Physics"; but it was luminously clear from what followed that it was unwieldy tripod, whose first leg was shrivelled beyond all comparison to its other two. Rutherford confidently asserted that therapeutic riches would accrue not through traditional anatomy but from her 'wealthiest sciences' of physics and chemistry. "Undoubtedly", he predicted, "the greatest achievements which <were> yet to be made in physiology <would> be accomplished by the chemist and physicist."(182)

Rutherford went on to assail that vitalism which, to some extent buttressed by natural theology, had proved inimical to the professional maturation of the experimental sciences he espoused. Rutherford extolled the work of Mayer, subsequently elaborated by Helmholtz and Joule, on the conservation and transformation of energy which, together with the related theories of Daltonian atomism and Darwinian evolution, constituted the intellectual core of scientific naturalism.(183) He endorsed the view that

"just as the matter of which living beings consist is simply a peculiar arrangement and combination of matter of which the inorganic world is composed, so the forces which organic matter exhibits are simply modifications of those forms of energy which we find in the inorganic world: they are but transformations of physical energy affected by peculiar arrangements and combinations of matter."

Physics and chemistry alone held the potential for shedding light on "the thick veil which yet shroud<ed>

the nature of life in mystery."(184)

When it came to specifying the nation-state in which institutionalisation and professionalisation had fostered the most intimate relationship between experimental physiology and practical medicine, Rutherford referred unsurprisingly to the land which had nurtured Haller in the eighteenth century and the physico-chemical reductionists of the Berlin group in the nineteenth. "Long ago", Rutherford enviously informed his students,

"the Germans perceived the vast importance of every physiological school being provided with a laboratory, furnished with all the physical and chemical appliances necessary for the prosecution of our science. They have approached physiology from the side of chemistry and physics. Public money has been freely given to assist them in scientific inquiry, and the result is that every German school of medicine there is a practical school of physiology, where an amount of work is done which, in the aggregate, is so vast that it surpasses the physiological work of all other countries put together."(185)

English life-scientists, Rutherford ruefully observed, were 'less fortunate': King's College Medical School had not yet secured a laboratory equipped to meet the requirements of modern physiology.

Five years later, the same William Rutherford, now Professor of the Institutes of Medicine at the University of Edinburgh(186), again confidently asserted that physiology was unashamedly an experimental science on which the future of practical medicine depended; he gave expression to the pristine physicalism which was

increasingly becoming the dominant idiom of the culture spawned by scientific medical educators. The workings of the human body closely resembled, in many respects, the workings of an ordinary machine: the physical laws of mechanics and heat therefore most deserved the attention of the medical student. The subject of pure physics merited 'a prominent and fundamental place' in any properly-conceived course of medical education on the grounds that it would impart to the student "facts and principles of universal application" and would train him in "the methods adopted in exact science."(187)

Unalterable physico-chemical laws governed the operation of the human bodily machine; students must attend, above all, to 'the inexorable laws of physiology' which furnished the only foundation for 'rational medicine'. It was futile to attempt to demarcate physiology as the science of the healthy 'normal' condition from pathology as the science of the diseased 'abnormal' condition. To those, clearly including Rutherford(188), of a progressive Huxleyite temper, pathology (based on the cell or molecule) was not 'applicable' to physiology, it was physiology.

One important observation on the content of Rutherford's addresses is demanded. The thrust of his observations and prescriptions clearly runs counter to the implicit ontological dualism, long uncritically resorted to by medical historians. This dualism would consign to the realm of the 'social', factors such as

institutional contexts, patterns of funding, and prevailing political beliefs, whilst reserving for 'science' a place in a hermetically insulated domain of ideas in which successive conceptual transformations in the bio-medical sciences unfold in a 'progressively rational' direction.(189)

Yet Rutherford consistently spoke of a particular conception of those sciences (experimental, vivisectional, reductionist) and referred to aspects of particular social milieux as a unity. Extensive professionalisation and institutionalisation of the life sciences was a reality readily discernible in German universities: espousal of the reform of those sciences in England in conformity with the German model was intended to promote the goal of securing comparable financial investment, institutional management and state support. Any separation between the conceptual fabric of biology and the social context in which it took concrete historical shape is artificial and obscures our sociological grasp of the interface between science and professionalism.

The central place of physiology on that interface was alluded to by David Ferrier (1843-1928), Professor of Forensic Medicine at KCL in 1874. Ferrier, another fervent believer in the vivisectionists' creed that the problems of the living could never be explained or countered in the dead-house, was prosecuted under the terms of the 1876 Act for performing, without proper

certification, experiments demanding cerebral lesions on monkeys.(190) As committed vivisectionist and chemist Ferrier personified the novi homines seeking to establish medicine on the certainties of the experimental method.(191) Ferrier's brief in his address to neophytes in 1874 was to confound and render noxious to a new generation of doctors that antipathy to rationalism which was the cynosure and soteriology of England's self-consciously clinical communities, members of which indeed saw Ferrier's scientific pedagogy as heresiarchal.

Ferrier conceded that all medical subjects were valuable to the prospective physician, but emphatically urged "in a more especial manner, the claims which Physiology <had upon medical students attention>" since that subject pre-eminently furnished "the groundwork of all scientific knowledge of the nature of disease."(192) Ferrier cited Manchester physiologist Arthur Gamgee, author of "Science and Medicine"(193), as authority for the view that only when "general laws connecting disease with health and establishing a perfectly rational system of therapeutics shall be applicable to the whole body of medical facts <would> the term 'science' be legitimately applicable to medicine."(194) Experimental pathology (studying the synthesis of disease) and experimental pharmacology (localising the action of drugs on the tissues and organs of the body) were rapidly following the footsteps of the advancing science of physiology

itself; the future lay with these developments which together augured the imminent appearance on the historical stage of a 'real science' of medicine.

The quest for scientific laws, universal and independent of time and place, which clinicians frequently warned their students to cast aside as worthless rationalistic dogmas which had impeded from time immemorial the maturation of the medical art were expressly championed by Ferrier as providing the indispensable basis of practical medicine. Ferrier explicitly warned his students to be on their guard against

"a large class who regard as misleading all attempts to rationalise therapeutics by reasonings and speculations founded on physiological or pharmaceutical experiments on the lower animals, and who look upon pure clinical and pathological observation as the only safe and sure road to trustworthy and stable progress.(195)

In the past, Ferrier admitted, certain medical systems had taken on the character of a rigid scholasticism, but from the mid-eighteenth century onwards, largely under the impetus of Haller's wide-ranging investigations, physiology had been cultivated as an experimental science guided by the canons of inductive research.

Ferrier deferred to the oft-voiced claims of clinicians that therapeutics had lagged behind failing to progress to the same extent or degree of exactitude as the experimental sciences, even conceding that personal idiosyncracies and the emotional states of

individual patients might need to be taken into consideration for purposes of diagnosis and therapy, but nonetheless confidently asserted that the progress of modern research based upon experimental procedures and vivisection held out the most promise for therapeutics. Man in a state of health, and in a diseased condition a fortiori presented such a complex assemblage of phenomena that the discovery of causes by 'mere clinical observation' would prove slow and always uncertain. Thus the application to therapeutics of "the same rigid system of experimentation by which other sciences, as physiology, <had> reached their high state of development"(196), was the ultimate answer to medicine's ultimate questions.

Ferrier articulated a wholly different prognosis, based upon an equally different interpretation of the implicit moral lessons to be learned from medicine's historical evolution, from that of clinical partisans like Samuel Fenwick, Assistant Physician to the London Hospital, who, in the same year, enjoined his students to "look into the history of medicine", pay special attention to Laennec, and understand that "all real progress <had> been made just in proportion as practitioners <had> founded their opinions on the close observation of disease."(197)

Clearly the discrepancy between Ferrier and Fenwick in particular, and the wider disagreements between 'clinical' and 'scientific' polemicists are revealing

evidence of a Janus-faced pedagogy in Victorian medical schools. On the one hand, we have identified an educational philosophy of experience that took its cue perhaps from the age-old observation of Aristotle, himself the son of a physician, that "you do not become a physician by books"(198) Such a profoundly experiential 'leitmotif' was frequently invoked by clinicians as the touchstone of truth whose validity was luminously clear throughout history, inscribed perhaps on the cadaver buried beneath every gravestone erected since the dawn of mankind. Clinicians articulated this anagogical 'credo' of the necropolis as the only secure means of promoting the physician's god-given task of active salutiferous intervention in the multifarious illnesses and diseases (recognisable by anamnesis and clinical techniques) of the hospital patient. This was a philosophy stressing intangible, chimerical qualities such as individual judgement or personal observation, yet paradoxically also expressed an almost dogmatic faith in the veracity, authenticity and sovereignty of clinical experience.

On the other hand, we have encountered an alternative educational philosophy which invoked general rational principles of physiology, pharmacology and pathology as the touchstone of medical truth, propriety and efficacy alike. 'Scientific' reasoning giving priority to stochastically linkable forms of knowledge grounded on the certainty of the datum which the rigorous

experimental procedures of the laboratory furnished for a new generation of self-conscious life-scientists stood in stark opposition to the epistemological individualism routinely put forward by the clinician as the lynchpin of the anatomy of clinical judgement. The basic thrust of the progressive scientific philosophy was conveyed in 1868 by Isaac Ashe's suggested maxim for the scientific physician - rerum cognoscere causas - in which only the master of the experimental situation could grasp the desired cognitive benefits and put them to use in pathology and therapeutics. By the last decades of the nineteenth century, protagonists of the scientific word had largely accomplished the positivist displacement of the fundamental biological question 'what is life?' by narrower more technical concerns in which the regularity of nature's operations was simply presupposed and unquestioned. The study of illness became transmuted into specialised intensive experimental investigation into the organisation and functioning of organic matter - precisely the long-term goal of the Huxleyites.

Each side of the divide between the 'word' and the 'ward', or, to change the metaphor, between the 'bedside' and the 'bench', buttressed its polemical stance with a variety of rhetorical ploys and symbolic resources - including a selective appeal to the favoured 'great men' of medical history, a partial and one-sided representation of the nature of disease (either a clinical entity or a physiological relation), and a

hortatory account of the basis on which the social aspirations of medical men might best be realised.

Divergence between laboratory-based and clinical styles of medicine was by no means apparent only at the level of conflicting general approaches to medical education. Its effects can also be seen in the specifics of what was to be taught. An episode that reveals this clearly is the mid-nineteenth century dispute between Alison and Bennett over the viability of bloodletting as a therapeutic strategy. Although this controversy took place in Scotland, it is worth briefly describing because of its direct relevance to the laboratory/clinic tension at work in disagreement over practical therapeutics.(199) When, in 1855, John Hughes Bennett delivered a lecture condemning the practice of venesection in cases of inflammation, he created a storm for, in so doing, he had dared to impugn the authority of Professor Alison, grandson of the great John Gregory and acknowledged leader of the Scottish medical profession. Alison and Bennett's factious and bitter debates throughout the 1850s polarised Scottish medical opinion and represented major conflict between the old and the younger generation of doctors over the legitimate sources of authority for formulating and validating therapeutics.(200) To a large extent, their radically discrepant medical training and consequently different professional identities underwrote this serious confrontation.

Bennett's continental education and enthusiasm for the experimental thrust, laboratory setting, and technical innovations of the new medicine has already been described. In challenging Alison's authority on venesection, Bennett was boldly seeking to vindicate the direct applicability to clinical practice of scientific theories based on patho-physiological knowledge acquired in the laboratory. By the late 1840s, via extension and development of Schwann's ideas on cellular formation and the blastemic model of cytogenesis, Bennett had arrived at a molecular theory of organisation whose fundamental corollary was the viability of rational molecular therapeutics.(201)

Focussing on pneumonia as a specific case of inflammatory disease, Bennett lucidly expounded the therapeutic ramifications of his scientific beliefs in his textbook of 1858:

"<p>pneumonia consists of an exudation into the vesicles and tissues of the lung, which coagulates and excludes the air. It is very doubtful whether a large bleeding from the arm can operate upon the stagnant blood in the inflamed part, or the congested capillaries in its neighborhood - that it can directly affect the coagulated exudation is impossible. But lowering the strength and vital power of the individual is directly opposed to the necessary vital changes which the exudation must undergo in order to be removed by cell growth and disintegration. Hence it is, in my opinion, that the mortality from pneumonia has diminished since large bleedings have been abandoned, and not because, as has been suggested by an eminent authority, inflammations, like fevers, have changed their type since the days of Cullen and Gregory."(202)

This characterisation of pneumonia was justified, according to Bennett, because scientific microscopy revealed that venesection could not influence cellular sequences. Not bleeding but 'restorative treatment' such as beef tea and greater reliance on the vis medicatrix naturae was demanded in order to combat this disease.

Professor Alison, by contrast, had acquired his entire medical education in Scotland, precisely in the tradition of Cullen and the Gregorys, and saw things very differently. He was not a microscopist and where Bennett saw inflammation as disordered physiology, Alison saw a discrete physical entity, a disease in its own right. The latter denied that recent scientific knowledge derived from auscultation or microscopical studies could legitimately be adduced to deny the existence of a specific clinical entity. Conceding that there might be certain instances where blood-letting was therapeutically inappropriate, Alison nevertheless broadly identified with the Cullenian view that for 'phlogistic diathesis' with a strong pulse and difficult respiration, venesection was both legitimate and desirable.

Alison was an uncompromising clinician in his insistence that medical practice and therapeutic innovation must ever be grounded "on empirical observation only." (203) He saw Bennett's imperious attack on bloodletting as a threat to Edinburgh's late eighteenth century medical tradition (according to which

clinical observation at the bedside was the sole legitimate basis for therapeutic practices) and to the professional respect he believed Scottish doctors had earned by upholding it. Both national pride and a staunch commitment to an exclusively clinical view of inflammation - not as 'symptomatic' but as an ontologically real disease - thus predisposed Alison to uphold the therapeutic viability of venesection.

The dispute between Bennett and Alison bears witness to the mutual incomprehension and basic incompatibility between medical teachers who expressed differential allegiance to the authority of the 'word' and the 'ward'. Each sustained his position in the controversy with intellectual resources that reflected his distinctive medical education and training. From the standpoint of clinicians, Bennett and his sympathisers were guilty of overly abstract scientific theorising. From the perspective of experimental scientists, Alison was culpable for flagrant ontological confoundedness. In therapeutics too, communication between the two traditions resembled a dialogue of the deaf.(204) The meaning of physiology and pathology for the treatment of disease was not a fixed or given absolute, but open to processes of social negotiation.

The equally animated debates of the 1860s over the clinical use of alcohol also demonstrate how internal divisions within the medical profession impinged on therapeutic practices.(205) Since the early Victorian

period, physicians had prescribed alcohol for its value as nutriment stimulating the nervous system and facilitating recovery. Some doubt was cast on this line of reasoning by the scientific investigations of two Frenchmen, Ludgar Lallemand and Maurice Perrin. Their chemical research suggested alcohol exerted little therapeutic action as it was discharged in its original form from patients' bodies through normal processes of urination and excretion. Where many English physicians were not unreceptive to the research and conclusions of these Frenchmen, they nevertheless continued to prescribe alcohol in relevant cases as if its therapeutic role had not been brought into question.(206)

Contemporary physiological theory might be drawn upon by practising physicians to legitimise their diagnostic and therapeutic decisions, but in situations of observed conflict between theory and practice, English medical men typically resorted to the traditional defence of the sovereignty of clinical experience over the transient theories of physiological science. Laboratory scientists manufactured new theories of alcohol's physiological properties and action; if consistent with doctors' experiences on the wards, confidence in the authority of clinical facts would be reinforced; but if physiological theories failed to account for observed changes in alcohol-treated patients, they would be rejected as therapeutically invalid. Once again the priority of

clinical experience over the physico-chemical laws of the experimental sciences was manifest.(207) Scientific theory might purport to explain the workings of therapeutic agents but could not be relied upon to guide clinical practice.

Perpetual Antagonists? A Cautionary Note.

One possible objection to the general argument outlined above might proceed as follows. Different polemical stances adopted by individual medical educators have been identified and characterised sociologically in terms of the particular sub-groups to which they belonged. In turn, these groups have been described as 'scientific' or 'clinical' communities according to their respective commitment to a set of beliefs, values and practices - a whole 'gestalt' or way of seeing - concerning the medical enterprise. These conflicting orientations have been explained in terms of a structural opposition between the poles of the scientific 'word' and the clinical 'ward' - a convenient short-hand for referring to the complex heterogeneity of views espoused by individual historical actors in different historical periods, which seldom corresponded to the pristine categories embodied in the ideal-typical constructs of the dichotomous sociological model.

Such explanatory cogency and analytical rigour, so the objection runs, is purchased at the expense of historical verisimilitude and comprehensiveness, obfuscating the empirical plurality of positions

articulated by the real historical actors of the Victorian medical world. More particularly, systematic focus on only two occupational collectivities critically obscures the possibility and existence of a tertium quid. The dichotomous model is also based on the mistaken assumption that the different sets of beliefs, cognitions and practices are necessarily mutually exclusive. Such an assumption ipso facto masks and camouflages the demonstrable syncretism expressly endorsed by some leading physicians which proved to be the harbinger of a more irenic relationship between the two factions.

Such percipient objections cannot be cavilled at or dismissed out of hand; the brunt of the criticism is, in part, just and valid. Representation of the alternative 'gestalts' of 'scientists' and 'clinicians' as diametrically opposed certainly has the effect of obscuring the capacity of those identified as clinicians to claim, in relation to their professional activities, that they, qua self-conscious doctors schooled in the hallowed traditions of clinical medicine, were truly more scientific than their self-styled 'scientific' adversaries. In therapeutics too, it is more accurate to speak of conflicting viewpoints over the meaning of 'science' for medicine's traditional concerns than of straightforward opposition between partisans of the bench and the bedside.

As for syncretism, there were indeed many who sought

to consummate the much misunderstood marriage between 'science' and 'medicine' even in the decades of the 1860s, 1870s and 1880s, when the progressive scientisation of medical education underpinned acerbic intra-professional disputation.(208)

One important attempt to bring together and somehow unite the discrepant cultures symbolised by the terms 'art' and 'science' of medicine was undertaken by Henry Acland, whose ambitions for rousing the University of Oxford from its prolonged dogmatic anti-scientific slumbers were the subject of chapter five. The aristocratic Acland was a powerful influence on the GMC, the BMA and a number of government commissions on public health and medical affairs.(209) His attempted symbiosis of medicine's clinical and scientific traditions, characteristically expressed in elegant classical prose, demands the serious attention of the historian.(210)

Throughout his long career as medical educator at the University of Oxford, Acland never wavered from his conviction that the 'general', 'scientific' and the 'practical' dimensions of medicine were inextricably interwoven. In his presidential address to the GMC in 1877 he contended that the principal desideratum of the times was to harmonise these elements in their due proportion in order to promote the optimum form of medical education. "So it has been", he insisted, "from Plato and Hippocrates to the time of Milton and Locke, so must it remain."(211) The previous decade, on this

occasion to the BMA, Acland had drawn the familiar distinction between the 'art' and the 'science' of medicine to propose an ingenious compromise. "Medicine", he averred, "is at once in advance of the exact sciences so called, and behind them", by which he meant in advance as a clinical art dictated by the emergencies and imperatives of medical practice, but behind in scientific exactitude. The GMC's most urgent task was "to advance the study of an Art which ultimately will rest in Science and to ensure such progress and knowledge as will give us scientific practice not divorced from rational empiricism.(212)

Acland's famous address on the relations of physiology and medicine to the physiological sub-section of the British Association in 1865 articulated the same characteristically unifying, culturally edifying and comprehensive philosophy. He maintained that it was the duty of the physician to do all in his power "to promote the advance of physiological knowledge unfettered and free", not simply because physiology was "a pure Science" but because it also furnished the optimum basis for furthering "the Medical Art." While maintaining throughout his life an unshakeable evangelical commitment, Acland made no vain attempt to resuscitate the failing fortunes of vitalism in the wake of the drift towards naturalistic physico-chemical reductionism. Acland remonstrated with his former mentor, Richard Owen, for his theologically-inspired

attacks on Huxley's work on the vertebrate skull, and warmly embraced the "incompromisingly(sic) precise" thrust of modern physiology. For that discipline, he contended, had become "a science, precise, of enormous extent, bringing to its support mathematics, advanced physics, difficult chemistry, accurate and comprehensive." This science offered the medical profession exactly the means it required to accomplish its ordained mission of conquering the ravages of disease and alleviating the sufferings of God's children.

Yet Acland also threw his weight behind one of the cardinal propositions of the clinical perspective, that "the applied and observational part" of medicine could only be learned "by the bedside of the sick." Acland concluded his address with the dialectical insight that "pure Biological Science and pure Clinical Art must each have their votaries, but it must be the aim of each to learn from the other what is necessary for himself."(213)

Moving forward from Acland's holistic conceptions of the 1860s and 1870s to the early decades of the present century, we shall see how a new meaning became attached to clinical research, minimising intra-professional disputation, and giving rise to more integrated approaches to medical education. Twentieth century developments are beyond the scope of the present thesis, but it is critically important to allude to the more

sybiotic relationships forged between protagonists of the scientific 'word' and the clinical 'ward' at the end of our period, in order to establish a vantage-point from which earlier conflict can be situated.

The early twentieth century position was unambiguously stated by five powerful contemporaries who promulgated their views on the aims and objectives of medical education as a contribution to renewed reform. The first was Ernest Starling, Professor of Physiology at UCL, who proposed a radical restructuring of the curriculum advocating a system of 'clinical units' through which the pre-clinical sciences might be fully integrated into the structure of British hospitals.(214) Secondly Abraham Flexner, whose report of 1910 was the principal document of American medical reform, decreed in his second report on European medical education that "the ward and the laboratory <were> logically, from the standpoints of investigation, treatment and education, inextricably intertwined." The clinic, according to Flexner, was 'scientific' in the fullest sense, because it utilised chemical and physiological procedures and represented "a determined, fearless and painstaking effort to observe, to explore, to interpret and to unravel."(215)

A similar preoccupation with the scientific ethos of the clinic is discernible in Sir William Osler's prescriptive injunction that "<w>e must have clinicians who keep in close touch with physiology, pathology and

chemistry and are prepared to transfer to the wards through the proper channels the knowledge of the laboratory."(216) Similarly, Sir Clifford Allbutt, Regius Professor of Medicine at Cambridge from 1892 to 1925, strongly urged in 1920 that every clinical school should have full-time professors with adequate laboratories and well-qualified staff who should be "continually irrigating the profession from the sponge of pure science."(217)

Finally, Sir George Newman, author of an official report on the future of medicine at the end of the First World War, argued that "the need of English medicine above all others at the present time <was> the opportunity for the cultivation of the laboratory method and the scientific spirit in the teaching of clinical medicine and surgery."(218) What he referred to as the 'conquests' of physiology and pathology required to be transferred from the laboratory into the ward and applied systematically by the clinical teachers.

All these commentators shared a profound conviction - that the clinical and scientific dimensions of medical knowledge and practice demanded fusion into a symbiotic unity which would genuinely integrate the insights of the 'word' and the 'ward', consolidate recent therapeutic achievements, and provide a more secure basis for a unified medical profession to further enhance its social position in twentieth-century British society.

The unilinear theme of the progressive scientisation of medical education and practice, of course, conceals significant changes in the underlying dynamic which appeared fairly rapidly in the last decade of the nineteenth century. As succinctly summarised by Stella Butler: "*n* the 1870s laboratory science offered medicine method not knowledge; by the 1900s in contrast, laboratory research was increasingly regarded as the basis for clinical advances." (219) A new breed of 'clinical scientist' - whose conception of clinical research expressed commitment to a creative and mutually fructifying symbient of 'academic' science now firmly ensconced in Britain's expanded university system (220), and the more immediately practical concerns of teaching hospitals - was the distinctive product of the late nineteenth century trend towards convergence. (221)

Undoubtedly one of the critical factors which underwrote the narrowing of the gap between the paradigmatic particularities of 'scientific' and 'clinical' approaches to medical education was the development, from the late 1870s onwards, of bacteriology and germ theory. Customarily identified with Pasteur's work on vaccines against anthrax and rabies, and Behring's subsequent diphtheria anti-toxins, these 'scientific discoveries' have often been seen as the final proof and vindication of the relevance and applicability of 'true', 'real' science to medical practice which 'at last' conferred upon doctors

miraculous powers to combat disease: such is the popular misconception of 'heroic' medicine.(222)

Acceptance of this image of the marriage of science and medicine, and of the gnostic enthusiasms of the first generation of bacteriologists convinced of the universal applicability of their aetiologically monist science and of the unlimited healing powers embodied in particular 'magic bullets'(223) believed to be capable of eviscerating every specific disease from the human body, would run against the theoretical drift of the entire thesis. Moreover, as Shortt has recently argued, even the 'revisionist' historiographical position which recognises the sheer therapeutic impotence of many scientific cures until the very end of our period, seriously runs the risk of propagating an implicit ahistorical scientism by reserving the profoundly disingenuous epithet 'scientific' exclusively for the effective therapies of the post-bacteriological age.(224)

Yet the advent of bacteriology and germ theory did substantially transform the climate in which the general public, long justifiably sceptical of medical men's professional claims, evaluated medical care and therapeutic practices. Governmental attitudinal orientations and perceptions about medical science were also transformed. The provision of public health services expanded in late Victorian England(225), in part a product of the diffusion of health consciousness

actively promoted by physiologists themselves.(226)
These changes worked to the long-term advantage of scientific missionaries who sought to disseminate the 'word', progressively formalise medical education, and transform the laboratory into the modern doctor's institutional sanctuary.

The way bacteriological science was embraced by prominent clinicians and put to the service of medicine at the end of the Victorian period has been the occasion for this 'cautionary note' to the effect that there is no necessity for the conflicting occupational roles and interests of scientists and clinicians to remain diametrically opposed, in total isolation, and unamenable to compromise in all circumstances and periods. On the contrary, it is undeniable that 'raprochement' between protagonists of the bench and the bedside was a goal expressly envisaged and energetically promoted by leaders of the medical profession both in Britain and America in the early decades of the twentieth century.

Bacteriology, conceived of as an array of aetiological principles and technical-instrumental imperatives both diagnostic and therapeutic, had substantially changed the face medicine presented to the world by this time. It is inaccurate therefore to speak of the 'perpetual antagonism' between the rival camps. Perhaps we are observing a paradoxical relationship rather than an irreparable split, but whether these

apparently convergent developments represented anything more than a profoundly uneasy symbiosis remains open to question.

The 'Word' Versus the 'Ward': A Sociological Analysis.

Howsoever the historian chooses to construe early twentieth century prescriptions for the reform of medical education, it remains one of the cardinal axioms of this thesis that socially-structured tensions - between self-conscious clinical teachers and those who saw themselves as custodians of the scientific method - were responsible for some of the sustained polemical confrontations taking place in British medical schools for much of the nineteenth century. The long-term significance of this deeply divided medical pedagogy for historical analysis of the professional evolution of medicine has been underestimated. Writing in 1976 on the divisions between physiologists and clinicians in modern American medical history, Gerald Geison remarked that

"<e>pecially now, when the scientific basis of modern medicine <was> taken so much for granted, the long-standing split between doctors and research physiologists seem<ed> worthy of more systematic attention than it <had> hitherto received."(227)

Although scholars have subsequently gone some way towards redressing this lacuna, the importance of the divide for an understanding of both the scientisation and the professionalisation of medicine in the nineteenth century has continued to be relatively down-graded, and deprived of the 'systematic attention'

which it continues to demand.

Table 8'C' presents the reader with an 'ideal-typical' schematic summary of the principal axes of engagement and confrontation between the contending parties of the 'word' and the 'ward'. The table clearly reveals the callipygic range of medically-related ideologies and practices on which protagonists of each of the rival camps took their professional stance, proclaiming autonomy and independence from their competitors. The more mellow and dulcet tones of the early twentieth-century epithalamium do little to temper the fortissimo motifs with which medical teachers self-consciously committed to the bedside or the bench sought to orchestrate their campaign in the earlier period to capture the hearts and minds of the future generation of doctors and win their allegiance to scientific or clinical medicine. The table is intended to convey the different structural bases of intra-professional conflict.

The objection that the categories employed in the model 'distort' or 'over-simplify' the diverse range of attitudinal responses (or even ideological positions) adopted by the relevant historical actors, though predictable, cannot be allowed to stand as valid criticism of Table 8'C'. The precise purpose of all models is, of course, to simplify, to abstract from the infinite complexity of any historical period, those elements which shed explanatory light on the historical

problems under investigation. It is not a question of the historical sociologist wilfully ignoring or shutting his or her eyes to uncomfortable facts or opinions which might call some of the categories of a model into question.

T.H.Huxley has been represented as an archetypal professionalising scientist, but was trained to be a doctor at Charing Cross Hospital Medical School. His views on medical education, furthermore, gave precedence to its emphatically practical purposes which demanded heuristic methods. Yet Huxley's opinions are simply not a problem for historical sociology, and are quite consistent with our argument that experimental scientists rather than hospital clinicians were more disposed, by virtue of their occupational identities and institutional affiliations, to defend the value of scientific theories and principles for the education of doctors.

The principal bone of contention, on which members of the different sub-groups broadly adopted a collective standpoint and sought to realise it through social action(230), was simply the place of experimental science in modern medicine. Where the one group fervently believed science was the guiding star pointing the way for the future development of practical medicine, the other was equally convinced that science would prove to be an ignis fatuus, a portent of a much less optimistic future devoid of the therapeutic success

whose realisation was the very 'raison d'etre' of the medical profession.

Medical students - the 'audience' to whom the conflicting schools addressed their different conceptions of the proper relationship between science and medicine(231) - were caught up in a complex web of historic transition and a partly contradictory socialisation process. Many students thus learned clinical medicine in hospital apprenticeship programmes where clinical studies remained largely under the control of medical practitioners who also determined and dominated examination practices until the 1870s. Yet students' academic medical education, increasingly nurtured in the civilising, gentlemanly 'milieu' of the university, was frequently in the hands of life-scientists who had actively promoted the separation of the pre-clinical sciences from clinical medicine and sought to render the former rather than the latter the dominant partner and the fundamental basis of the modern doctor's professional expertise.

The experience of Sir Henry Dale whilst a student at St.Bartholemew's Hospital Medical School was typical. He was instructed by his principal teacher, Samuel Jones Gee, also physician to the Prince of Wales, to "forget" all the physiology he had been taught under Foster, Gaskell and Langley at Cambridge University(232) - the very institution which had fostered England's first successful, internationally-acclaimed research

school.(233)

So unsympathetic to scientists' claims concerning the utility of experimental physiology to practical medicine were the governing authorities of some London hospital schools, that active student pressure was necessary before curricular reform was effected. At St.Mary's it was not until 1882 that an enquiry affirmed it was "desirable that the lectures on Physiology should be given by an expert in that Department"(234), who should devote all his time to the subject, and receive a special salary for his labours. Even then, no immediate action was taken to implement the enquiry's recommendations. Only in 1884, after students had submitted formal complaints about the defective teaching of Mr.Pye (which they clearly perceived to be at variance with recent textbooks) was Augustus Waller appointed full-time Lecturer in Physiology.(235)

Even the co-existence of progressive experimentally-oriented life-scientists and traditional clinicians within the same institutional structure was no guarantee that a more integrated medical education would emerge. For a long time many laboratory-trained scientific researchers were treated as inferior by clinicians, and, for their part, life-scientists largely shared the disdain and contempt of Bernard, Ludwig and du Bois-Reymond for the 'vulgarities' of mere medical practitioners.

The relative lateness of clinicians expressing

hostility towards the incursions of laboratory research into medical practice, and its corollary (the perdurability of clinical ideology) must be emphasised. Even at the end of the nineteenth century, when general acceptance of bacteriology and germ theory had strengthened the hand of bio-medical scientists, clinicians continued to insist that physicians were made at the bedside, and to warn their clinical students to put their 'scientific theory' behind them when they came to embark upon 'real' (clinical) medicine.

The increased importance attached to the pre-clinical sciences by Huxley and his successors continued to run into opposition in the late Victorian period from those who still believed that personal tradition and first-hand clinical experience outweighed scientific book-learning and disputation.(236) The medical students of eminent clinician Pye-Smith were enjoined, as late as 1900, to

"never allow theories or even what appear to be logical deductions or explanations, however ingenious, or statistics, however apparently conclusive, or authority, however venerable, to take the place of the one touchstone of practical medicine, experience."(237)

Such a pristine, undisguised and naive invocation of the untrammelled virtues of experience is indeed a profound reflection of the resilience and tenacity of clinical empiricism in English medicine.

Having established in some detail the existence of a cultural dichotomy in English medicine during the

Victorian period and of intra-professional rivalry between contending cultural protagonists, how is it most convincingly to be explained? One interesting, but in the last analysis misleading and unfortunate dimension of previous attempts to explain the conflict, will be eschewed in the present analysis. This is the tendency for historians self-consciously to 'enter the battle' and identify with one or other group of antagonists, thereby casting, with a greater or lesser degree of sophistication, some form of historical verdict on the causes and outcome of the polemical disputes.

A clear example of the cruder kind of historical explanation has been provided by Newman, who appears to accept every word uttered by traditional clinicians against the progressive scientific reform of Victorian medicine at its prima facie value; and asserts simply that if 'Science' ever triumphed, "the end would be that medicine would cease to be a profession, the physician would become a physico-chemical technician and the surgeon a cabinet-maker working on soft matter." (238) While the historiographical implications of this judgement are interesting in seeming to suggest that scientific protagonists were effectively 'de-professionalising' English medicine, it scarcely merits serious intellectual consideration.

More subtle, but no less judgemental and question-begging, is Schiller's account of the influence (here seen as salutary and eufunctional) of

physiological science on medicine. He refers to the characteristic hostility of the clinician to the intrusion of experimental life science into medicine as the principal 'obstacle' which stymied the emancipation of scientific medicine; he further characterises the clinical emphasis on medicine as an erudite art as an "illusion".(239)

Schiller somewhat whiggishly laments the fact that it

"took time before <doctors realised> that lesions were the effect not the cause of diseases, that there were diseases without(sic) lesions and lesions without clinical manifestations"(240),

which is to presume without further analysis that the physiological view of disease as a dynamic totalising relationship rather than the ontological conception of clinicians has been 'proved' scientifically correct - a presumption all the more dubious for apparently missing the point that the initial success of bacteriology was widely seen as giving a new lease of life to the clinical ontologic standpoint.

For a final more sophisticated example of a medical historian endorsing the position of one or other contending party, let us briefly consider a study of Geison on modern American medicine. More than in the previous two examples, Geison appears aware of the historiographic advantages of adopting an attitude of anthropological scepticism towards the claims of each faction, yet nevertheless feels constrained to ask (and answer affirmatively) 'whether skeptical clinicians had

a point?' in failing to be seduced by the rationalist claims of scientific polemicists. He implicitly defends the former from the charge of the latter that an insidious combination of reactionary short-sightedness and economic self-interest underpinned clinical antagonism towards scientific medicine.(241)

Irrespective of the reasons why some medical historians appear to have abrogated the customary emphasis upon 'distanced objectivity' and 'neutrality' and adopted instead an evaluative, more subjective approach, it is contended here that embracing a more rigorous sociological analysis of processes of professional formation offers a way out of the cul-de-sac without any need to take sides in the dispute. On the contrary such analysis suggests that the cultural dichotomy between the 'word' and the 'ward' was, in the last analysis, a situated product of alternative occupational strategies of professional advancement designed to accomplish the project of upward collective social mobility. In this light, the existence of cultural tensions and intra-professional enmity in Victorian medicine is entirely unremarkable as the latter was neither a purely 'scientific' nor 'clinical' endeavour, but an activity through which different communities earned their livelihoods in a particular concrete historically-organised milieu.

The basis on which the alternative strategies were erected and propagated has been adumbrated by two French

sociologists, H.Jamous and B.Peloille.(242) Although their analysis focusses upon changes in the French university hospital system, the categories they deploy and the typology they develop are not restricted to the French context, and are largely relevant and applicable to the internal tensions within the medical world of Victorian England.(243) They suggest a conceptual scheme for an analysis of professional processes which gives emphasis to an important duality within professional knowledge between 'indeterminacy' on the one hand, and 'technicality' on the other.

By the former term is connoted those elements of professional knowledge which defy precise formulation and rational codification according to objective 'scientific' criteria - a range of 'virtualities' which might be acquired through initiation, ascription or individual experience. This is a sphere of tacit, private knowledge which can seldom be taught explicitly through lectures or text-books; it is more likely to be 'picked up' serendipitously through immediate contact with the complex vicissitudes of life and the world. Cognitive indetermination facilitates the process of monopolisation on the basis of intangible, charismatic and unique qualities which can, somewhat paradoxically, be possessed exclusively, collectively and corporatively and deemed to be essential to the continuance of professional production.(244)

By the term 'technicality', in contrast, is connoted

the sphere of cognitive rationality which allows and gives primacy to the codification of technical knowledge according to objective and intersubjectively accepted 'scientific' criteria rather than the unformulateable, imprecise elements of professional knowledge. Jamous and Peloille seem to suggest that all forms of production are socially accomplished by incumbents of occupational roles whose collective identity may accurately be characterised in terms of the ratio between 'indeterminacy' and 'technicality' assumed in each relevant instance. The I/T ratio is held to represent a duality and contradiction which is inherent and universal in all processes of production; it is put forward in order to shed light on strategies of monopolisation, the role of ideology and legitimation in social conflict, and internal divisions within occupational collectivities.(245)

One problem, from the standpoint of the Victorian medical profession, with the sphere of 'technicality' or cognitive rationality should be immediately apparent. For to the extent that the configuration of knowledge around which professionalising groups have often coalesced is rationalisable and transferable, it becomes possible for outsiders to organise and challenge the monopoly which has been built upon it.(246) For this reason, Jamous and Peloille argue that 'professions' as such tend to be characterised by a high I/T ratio because the codification of increasingly technical

knowledge fails to provide a secure basis for professional status. Particular historical circumstances largely determine which professional ideology will remain uppermost given the permanent tension between indetermination and technicality. Social forces and the possession of power resources will operate in such a way as to give precedence either to those who claim their professional authority from scientific expertise or to rival groups who base their legitimacy upon "individual and social potentialities, experience, talent, intuition"(247) and other such elusive, asomatous qualities.

Clearly the consistent strategy of clinicians throughout our period, and more emphatically during the later decades of the nineteenth century when under threat from proselytising scientific researchers, was to perpetuate their predominance by underlining the margin of indetermination inherent in medical production. Hence they developed an ideology which served to valorise clinical medicine, and sought to promote the goal of prolonging their hegemony over the production and transmission of medical knowledge.(248)

When, in 1851, William Bowman warned his students at KCL that long, laborious and patient study of details was the only safe route to becoming good doctors, he stressed above all the value of 'experience'. Older members of the profession, he added, were privileged in possessing it: "<m>uch of their knowledge <was>

incommunicable, and as they <had> accumulated it for themselves, so it <would> perish with them."(249) Bowman was here articulating in pristine form the ideology of indeterminacy whose ultimate purpose was to perpetuate the authority and prestige of hospital clinicians in the Victorian republic of medicine. Many clinicians followed Bowman's footsteps in this respect in seeking to define professional excellence in terms of qualities and virtualities which they alone possessed - hence the ritual incantation to the indispensability of 'bedside experience' in formulating effective therapeutic strategies.

Above all, medical education conceived in accordance with the assumptions of indetermination was centred around the anatomy of 'clinical judgement' which was emphatically not reducible to explicit rational formulae. The term 'clinical judgement' in effect became a shibboleth of practising physicians who invoked the principle to justify and legitimise the diagnosis or choice of treatment they prescribed. As against formal, logical or mathematical representations of the medical enterprise, the clinician pointed to the experiential origins of the capacity of medical judgement and identified learning at the *Kinder* as the only source of acquiring it.(250)

The dogmatism with which this conception of medical education was identified as the only basis on which 'real' medicine (and its professional status) might rest

stemmed, according to our thesis, from the serious threat posed to the clinical elite by growing numbers of life-scientists who sought to reform and reconstruct English medicine around a knowledge-base of scientific expertise or 'technicality'. Paradigm confrontation intensified as a result of intra-professional competition for place within the professional hierarchy of Victorian medicine.(251) The historic conflict between protagonists of the 'word' and the 'ward' does not require adjudication from medical historians: its origin lay in the dialectical tension between indetermination and rational codification manifest within the process of professionalisation; and its outcome depended upon the resources (material and symbolic) which participants brought to bear with them in the concrete field of social interaction where intra-professional battles were fought and won.

It remains only to demonstrate how our cardinal theme of intra-professional segmentation differs from conventional wisdom in the field; for the extent of the cultural divisions within Victorian medical education has seldom been adequately documented nor properly understood. Charles Newman's critical observations on the GMC's short-sighted preoccupation with 'the safe general practitioner' have too often been taken to imply that divisions of interest and purpose over the fundamental objectives of medical education somehow evaporated into all-embracing conformity to this shallow

ideal.(252) Noel Poynter, on the same subject of the safe general practitioner has argued that "<t>hroughout a century of unprecedented advances in scientific knowledge, this remained the ruling concept in medical education"(253); but it did relatively little to conceal the cracks and divisions between medical scientists and clinicians, as the Haldane and Goodenough Commissions on medical education subsequently discovered.(254)

Nor is Roberts' judgement that tensions between medicine's theoretical and practical studies were "more acute before the nineteenth century reforms"(255) consistent with the findings of this thesis. On the contrary, the introduction of experimental and laboratory procedures, in part the product of reform, into English medical schools and universities had the effect of exacerbating conflict over both the ends and means of medical education. These developments were bitterly opposed by many traditional clinicians who firmly believed, with some justice, that their distinctive modi operandi were threatened by the incursions of outsiders.

The renewed conflict was less Youngson's characteristically whiggish "struggle between the new attitudes of scientific observation, experiment, reasoning and innovation, and old attitudes of classical culture and conservatism"(256) (for the elite of the profession included many who set out to reconcile the new 'science' with the old-fashioned virtues of liberal

culture for the social cachet it would purchase) than a struggle between advocates of the hallowed, pristine and long-tested canons of clinical experience on the one hand, and those of the cognitive supremacy, methodological and experimental rigours of a new-fangled medical science on the other.

In an originative and germinal study(257) Jewson sketched the progressive disappearance of the sick man from medical cosmology from a situation in which pathology was underpinned by an integrated conception of the whole person, to an alternative situation less than a century later in which the patient was seen in terms of a network of bonds between microscopical particles. From a person-oriented cosmology in which emotional and spiritual elements of a total body system were integral to the perception of life evolved an object-oriented cosmology based on the findings of experimental physiology according to which life consisted in the operation of blind physico-chemical laws.

Devaluation of the subjective experience of the sick man began under hospital medicine, but his eventual disappearance was a consequence of the arrival of laboratory medicine which resulted, in Jewson's words, in "a monolithic consensus of opinion imposed from within by the community of medical investigators."(258) The evidence of late Victorian medical pedagogy, however, suggests the absence of any such monolithicity, and that clinical power rooted in hospital medicine long

outlived the supersession of the latter by laboratory medicine. Nevertheless, the rekindling of English medicine's divided fire with renewed heat from the 1860s onwards took place for precisely the reasons implicit in Jewson's analysis. For it was the overdetermination of contradictions(259) spawned by the historic transition from one distinct mode of medical production based upon the hospital to another based upon the laboratory that stimulated the recrudescence of conflict between the clinical and scientific communities.

Hospital medicine celebrated in acute form the interests and perceptions of the clinician as reflected in the expressed allegiance of physicians to the reigning assumptions of pathological anatomy. Laboratory medicine originated in German universities and celebrated the interests and perceptions of the scientific research worker as reflected by the elevation of experimental physiology to a position of primacy as the science 'par excellence'. It posed a grave and disturbing threat to clinicians who recognised that if ever "medical practise(sic) became an appendage to the laboratory"(260), their distinctive cultural predilection for careful observation and induction would be eclipsed and the entire 'rationale' of the clinical philosophy of medicine jeopardised. They foresaw, and viewed as anathema, a state of affairs in which a professor of medicine would no longer be schooled and experienced in the treatment of the sick, but rather

noted for research work in some particular specialised field in the physical or biological sciences - hence the prolonged rear-guard campaign of opposition to scientification.

In view of the clear divisions within Victorian medical education of which tangible evidence has been presented in the thesis, the apparent unifying synthesis (however attenuated) of the early twentieth century was all the more impressive. Its maturation was reflected in a thoroughly science-based clinical pathology - the organised application to medicine of the complicated chemical, microscopical and bacteriological techniques of the research laboratory.

When Abraham Flexner advocated the systematic correlation of bedside and laboratory work as the foundation of modern medical education(261), he was seeking to bring together in symbiotic unity, two radically discrepant cultures and practices which by that time, however, appeared to share one vital thing in common - a philosophy of certainty based upon the incontestable facts of the clinic and laboratory respectively. Shortt has recently argued that by the end of the nineteenth century, Anglo-American physicians had become "the personification of omniscient science."(262) Perhaps their achievement was yet more triumphal, for it was an omniscient clinical science. The doctor was endowed with a doubly immediate and privileged access to the esoteric mysteries of disease. He was likewise

blessed a fortiori with a doubly secure basis on which to consolidate those professional gains that had been his active and self-conscious accomplishment.

CONCLUDING OBSERVATIONS

"The most serious obstacle in the way of an historical sociology of science and medicine is the implicit assumption in many circles that such a discipline should take the form of a science of science." L.Jordanova.(1)

This thesis has consisted in an historical sociology of medical education from the eighteenth century to the beginning of the present century. Its major geographical focus has been England but the specificity of English developments has been clarified, where appropriate, by a brief examination of the historical evolution of medical education in alternative contexts(2), mainly France and Germany. The title of the thesis has been intended to convey the fundamental importance of investigating the relation between a form of knowledge (science) and the gaining and exercising of a form of social power (professionalism) in a particular historical context with respect to medicine.

This conclusion comprises a succinct summary of the critical arguments of the thesis via an examination of the extent to which medicine had become a 'profession' at the end of the nineteenth century, and of the socio-historical processes whereby professionalisation took concrete shape. It is far too simple to explain the undoubted 'professional' success of doctors at the end of the nineteenth century as an unmediated product of their collective invocation of the cognitive supremacy of 'science' conceived as a monolithic value-system.(3) At the same time, however, different segments of the medical profession were able to substantially bolster

and advance their various social, economic and political claims by appealing to the authority of a body of esoteric knowledge, skills or expertise which was inaccessible to the layman, and which they alone, through a period of prolonged education and training, had acquired and possessed. Only in this more subtle contingent sense (cognisant of the specificity of local contexts(4) and the complex variety of interest-groups comprising a profession in a particular historical period) does the thesis seek to defend and re-articulate against the recent revisionist critique the case for explaining the professional accomplishments of Victorian doctors as an aspect of the emergence and growth of scientific medicine.

Omnium consensu, at the end of our period, the Victorian doctor was a member of a highly-esteemed, prestigious, well-rewarded and almost universally recognised 'profession' of medicine. Subsequently, medicine became regarded as the archetypal profession, and other occupational groups seeking to collectively enhance their status have often emulated doctors and adopted comparable strategies - of 'closure' or 'usurpation' according to the relevant group's position within the professional hierarchy - to achieve comparable goals.

Agreement shatters when one attempts to specify the precise criteria according to which occupations might be characterised to a greater or lesser extent along a

continuum of paradigmatic professionalisation. Few categories of social scientific discourse and disputation have proved to be more 'essentially contested'(5) than the concepts of 'professionalism' and 'professionalisation'. Indeed, no set of occupations has been assigned so many contradictory functions, political goals, cultural outlooks, or structural bases than the professions; and no grouping has been so diversely labelled - as 'servile lackies of the capitalist class'; 'leaders of a service society'; or 'self-interested harbingers of a dismal and soulless bureaucratic future', to mention but three(6) - and so ill-defined as to its socio-economic boundaries.(7)

Compounding purely conceptual and definitional problems is the further difficulty that perceptions of the professions are themselves socially and historically determined. Different accounts of the social role of professional strata within a wider division of labour, or the historical role of professional occupations in the process of societal evolution, have often revealed more about the values and self-conceptions (not to mention professional aspirations) of sociologists and historians than the realities of professionals' work, privileges and beliefs.

Only in the last two decades have more insightful and intellectually refined approaches towards understanding the professions been proffered.(8) Hitherto there was widespread endorsement of a critically distorted view of

the professions based on prima facie acceptance of professional self-evaluations, whereby the high social status, economic benefits and disproportionate weight within society - goals for which aspirant professionals had fought and accomplished - became a simply taken-for-granted and 'natural' consequence of their 'disinterested' performance of strategically-located and socially necessary occupational tasks.

The critical factor in questioning and undermining of 'trait', 'attribute' and 'functionalist' approaches within the sociological community was the adoption of a fundamentally more historical perspective which rendered problematic the static categories of these received sociological models. The present thesis is conceived from this critical standpoint and assumes that many of the conceptual and interpretive questions surrounding the phenomenon of professionalism are most satisfactorily answered through systematic historical research.(9)

Hence for all the apparent intractability of defining and conceptualising professionalism as such, the elements and bases of Victorian doctors' professional success at the end of our period are tolerably clear from the main body of the thesis. For we have seen that the basic rationale of professionalisation lies in: the definition by members of an occupational community of themselves as 'professionals'; the limitation of access to membership on the basis of education, qualification

and certification according to criteria largely determined by themselves; the promulgation of various codes and standards (of ethics, for example) which supposedly embody rational, disinterested principles such as 'service' or 'the public interest'; the eventual development (albeit long tempered by intra-professional dissension) of feelings of group consciousness and solidarity often realised in connection with particular institutional contexts such as the hospital or university; the collective production of a body of knowledge or technical expertise fully differentiated from general culture and possessed exclusively by the occupational group; and the negotiation with representatives of an emergent, relatively autonomous modern state for a favourable and explicitly-sanctioned market position within the capitalist order.(10)

Unlike many of the supposedly 'universal' traits or attributes of the professions (such as the Parsonian pattern-variable of 'collectivity orientation') the dimensions of professionalisation specified above are consistent with the actual historical processes by which Victorian doctors accomplished the project of securing professional status and rewards. Crucial aspects of the analysis of professionalisation developed in this thesis are: the role of institutionalisation; the importance of a knowledge-base around which to negotiate for cognitive exclusiveness; state mediation; and internal divisions within the wider occupational community. Each must be

briefly examined in turn.

First, institutionalisation. The institutional transmission of a body of knowledge has often been seen as a significant dimension of professionalisation. Two particular institutions played a crucial role in the history of the Victorian medical professions - the hospital and the university. The development of hospitals as the institutional loci of modern medicine is a structural phenomenon of almost anagogical significance.⁽¹¹⁾ These institutions became centres of education - 'medical schools' where study of 'choses medicales' became inextricably intertwined with clinical perception, and where far-reaching changes in conceptions of diagnosis and disease revolutionised both medical science and practice.

Yet the evolution of the hospital medical school in our period was a long and protracted process in which professionalism encountered strong countervailing forces, principally in the form of prolonged gubernatorial hegemony. Not until the 1870s and 1880s, largely through doctors extending their jurisdiction over the organisation of medical education, was the authority of lay boards of governors undermined and medical impotence within the hospital overcome. Increasing emphasis upon scientific knowledge, clinical experience and the privileged authority of doctors was the rationale for transforming hospitals and their medical schools into fully-fledged professional

institutions.(12)

It is also difficult to exaggerate the significance for the long-term project of professionalisation of the development of a modern university system.(13) In the eighteenth century, the common avenue of entry into medicine was, of course, through apprenticeship; at the end of the nineteenth century, all aspiring doctors were obliged to study medicine at a university before embarking on their careers. Intense and protracted disputation over the cultural function, intellectual merits and social purpose of the university old and new, bore witness to the different interests at stake over the future of higher education. Some bio-medical scientists, notably Huxley and his circle, engaged in active and creative struggle with clerical interests in the universities in order to challenge and de-throne the long-established cultural hegemony of theological and philosophical consciousness.(14) Though expressed in noetic disputes of considerable esoteric complexity, concrete professional interests as well as abstract ideas were implicated in these university controversies.

As nineteenth century doctors recognised, the professional status of their sixteenth century forebears owed much to the development of medieval universities which provided an institutional basis on which to claim professional standing. At the end of the medieval period, physicians could point to the production of a body of knowledge unknown and inaccessible to the layman

- knowledge preserved in Latin and acquired through dedicated scholarship. Ipsa facto, only the physician possessed the superior professional learning necessary to practise physic.(15) In the later period, physicians sought to perpetuate their privileged position through identification with the governing gentry and confinement of their number to graduates from the ancient universities, thereby excluding the lower orders from their ranks.

. After the 'great transformation' of the industrial and democratic revolution, professionalisation was largely a secondary phenomenon consisting of a usurpationary effort on the part of the rank-and-file to challenge the existing distribution of power and prestige within the profession, and to transform the avenues of medical patronage - not to overthrow but to disperse privileges more widely. Increasing access to higher education, and counterposing merit, rationality and science to the iniquities, privileges and anomalies of the 'ancien regime' were among the principal means of effecting that transformation.(16) In long-term historical perspective, the disintegration and breakdown of the medieval church's monopoly over the basic means of orientation was critical to the subsequent production of new scientific knowledge and the emergence of scientific establishments whose institutional locus was the modern university.(17)

In long-term perspective, the universities were

transformed from a stage in which they were predominantly church-dominated 'clerical' institutions to state-controlled 'scientific' institutions. It was a protracted, complex (and by no means yet concluded) process crucial for the long-term cognitive monopoly of the scientific 'Weltanschauung' and for a range of more localised and specific developments. Michael Foster's successful research school in physiology, for example, hinged on the reform of Cambridge University and the parallel phenomenon of the 'revolution of the dons'.(18) Whether the historian chooses to discuss 'research schools', 'emerging specialties', 'scientific establishments' or 'disciplines' as the basic units of analysis, the institutionalisation of the sciences in the universities during the 'second scientific revolution' of the nineteenth century was clearly a fundamental precondition of their emergence.(19) At the end of our period, all doctors could justly claim that they were educated at the same prestigious kind of institution which for centuries had been the exclusive preserve of a tiny elite of upper-class physicians.

What of the role of knowledge and expertise in the professionalisation of Victorian medicine? In many ways this is the ultimate question of the present study - a question on which the intellectual energies of historians and sociologists have long been expended, albeit with the outcome of few, if any, commonly accepted conclusions. Crudely positivistic and whiggish

medical history long portrayed the professional success of Victorian doctors as the inevitable and legitimate outcome of their allegedly tangible scientific and technological accomplishments, thus positing a categorical relationship between science and professionalism.

More recently, various forms of revisionism have found a more receptive audience.(20) It is now more widely accepted that professional prestige and authority derived less from the therapeutic efficacy and technical competence embodied in scientific medicine than from regular doctors' ultimate success (only at the end of the nineteenth century) in convincing the public to believe claims about the healing power of science, irrespective of its real practical accomplishments. Professional power germinated out of the social evaluation placed upon medical work rather than the effects of the work itself.(21)

A further dimension of the revisionist case is the emphasis on the prolonged hegemony and cultural primacy in the Victorian medical world of essentially 'non-medical' and 'non-scientific' values. While at first appearing somewhat paradoxical, this claim refers to the manifest cultural predilection of the Victorian medical elite for gentlemanly values, liberal learning, classical and general education, character, erudition and moral qualities rather than specialised scientific and technical competence.(22) The epistemological

difference between these different cognitive bases and value-systems was precisely the social and cultural difference between the still predominantly aristocratic elite clinician and the 'parvenu' rank-and-file scientific practitioner.

Such arguments are clearly 'revisionist' in seeming to question and undermine any assumed direct causal relationship between 'science' and 'professionalism'. A more radical revisionist thesis exists, however, whose basic argument proceeds in outline as follows. Professional forms of organisation and professional autonomy as well as consciousness were largely developed before the period in which scientific medicine began its spectacular progress with bacteriology and germ theory. By the mid-nineteenth century, doctors had largely emancipated themselves from their dependence upon upper-class patients and succeeded in shifting away from a client-dependent towards a collegiate form of occupational control.(23) The Industrial Revolution and its associated social consequences - urbanisation, demographic growth, changing standards of living, technological developments - were, in the last analysis, the decisive factors in the historic success of Victorian doctors. The expansion of demand for medical services in a society with a swelling and increasingly prosperous middle-class enabled doctors to respond and profit from their professional production.(24)

If true, this mode of reasoning clearly suggests a

more circumscribed role for expert knowledge of whatever kind in the process of professionalisation, and appears to wrest asunder any hypothesised inter-connection between 'science' and 'professionalism'. The argument of this thesis, however, does not support this stronger form of revisionism which it holds to be unwarranted by the historical evidence.

Two principal objections may be levelled against the radical revisionist position. First, theories which give explanatory primacy to 'demand' factors and the burgeoning of 'social needs' are misleading in so far as they are based on the reification and hypostatisation of certain aspects of the historical process of professionalisation. Medical professionalism was not a straightforward response to clearly defined social needs. Many of the 'needs' new professionals claimed to satisfy were invented or constructed by themselves to promote their claims for upward social mobility. Doctors played upon public fears about diseases; ridiculed popular traditions of folk medicine and self-help as 'primitive', 'backward-looking' and 'unscientific'; adopted a deliberately mystifying jargon incomprehensible to the general public; and by such means actively sought to create demand for their own services.(25)

Secondly, and most importantly, I have consistently argued that claims about the cognitive status, instrumental power and social utility of different forms

of medical knowledge and practices were a critical element of Victorian doctors' campaigns to elevate themselves to a prominent position in English society by becoming established as professional men.(26) I have sought to specify the concrete mediating links between various fragments of knowledge and the different socio-economic and political goals of heterogeneous segments of the medical profession. Different interest-groups invoked scientific knowledge selectively in different contexts and periods. .

Science should not be viewed as an undifferentiated cultural totality with an all-embracing value-system; it meant different things according to circumstances and the structural position of the relevant occupational community. Leading surgeons, for example, drew extensively on the Hunterian tradition whose intellectual qualities were well suited to raising their status to a position of professional parity with gentlemanly physicians.(27) For the elite, increasingly ensconced as hospital consultants, scientific knowledge and technical expertise were valued much less than good breeding, the Oxbridge mystique and vestiges of aristocratic culture.(28) In contrast, the rank-and-file practitioner seeking to redeem his marginality had greater reason to espouse the 'objectivity' and 'rationality' of the scientific 'Weltanschauung' which could be and was adduced in support of liberal-democratic political objectives.(29)

Above all, this thesis has sought to advance debate over the complex historiographical issues surrounding the professionalisation of medicine in the nineteenth century by distinguishing three separate contexts in which doctors drew upon the rhetoric of science in support of professional objectives. I have sought to shed light upon the social constructions of knowledge; to examine interest-group representations of the 'complexity of knowledge'; and to elucidate the historical interplay of constellations of knowledge-based forces shaping processes of occupational development. Although the different contexts may have overlapped in practice, it remains heuristically valuable to regard them as analytically separable elements of professionalist strategies.

The first context relates specifically to the attempt by general practitioners to mount a deferential challenge to the numerically small but disproportionately powerful medical elite, whose legitimacy was founded on collective induction into the ethos of classical aristocratic culture, and whose privileged position rested on the monopolistic restriction of access to those schooled in the ivory towers of the ancient universities.(30) There was a strong element of cultural apartheid to the espousal of science in this context, and historians have long posited some association between religious nonconformity, political radicalism and cultural

activism in scientific practices and institutions.(31) Because it was directed so insistently at the bribery, corruption and nepotism of the elite in order to undermine the established pyramid of prestige and hierarchy within the profession, general practitioners' campaigns for medical reform on the basis of science included the espousal of strong anti-monopolistic rhetoric - an aspect of professionalisation which has tended to be underestimated by sociologists and historians of medicine.(32)

The second context in which scientific knowledge was deployed in furtherance of professional goals is more compatible with sociologists' customary emphasis on doctors' monopolisation of the medical market for professional services. Here we refer to the extensive labours of regular practitioners to eliminate economically damaging competition from a host of alternative practitioners - homeopaths, herbalists, medical mesmerists, 'folk' healers and the like - commonly, but judgementally, referred to as 'quacks'. Plagued by the abundance of such 'quackery', self-styled 'regular' doctors recognised that education in the rigours of scientific medicine furnished a basis for the subordination of competing sects to the dominant forces within the profession, i.e. themselves. We saw how Thomas Wakley and other spokesmen for the scientific reform of medical education orchestrated campaigns of vilification and persecution against potentially threatening

'outsiders', especially when, as with Henderson and Elliotson, opponents occupied influential positions within the universities. 'Quackery', we argued, was effectively a social construct and a fundamental aspect rather than a cause of professionalisation.(33) Securing occupational power and prestige entailed controlling rival producers as well as responding to the market for the consumption of medical services.

Thirdly, we demonstrated the critical role of science as 'expert knowledge' in negotiations to secure a state-sanctioned legal monopoly for regular doctors as defined by inclusion on an official register. State mediation has long been recognised as a form of occupational control which enhances, in long-term historical perspective, the power and prestige of professionals. The saliency of the medical function certainly favoured doctors' hand in seeking to secure state intervention for purposes of registration, licensing and legitimation.(34) We did not, however, obscure the fact that state intervention was a long, complex and nuanced process given the prevailing 'laissez-faire' temper. Yet the vital importance of public health, the successful diffusion of health consciousness on the part of physiologists and sanitarians, and the dramatic recurrence of serious epidemics ultimately compelled the state to give credence to the claims of scientific medicine and to recognise the indispensability of the medical profession

to the smooth functioning and regulation of modern industrial capitalist society.(35) Though we argued the Medical Act of 1858 was less of a climacteric in the history of medical legislation than has often been supposed, the subsequent development of the medical profession was to a great extent embroiled in, and bound up with, the evolution of the British state.(36)

Just as 'science' as a system of knowledge has been disaggregated to convey a more finely-textured sense of the various purposes, goals and interests to which it was put, so we have differentiated between segments of the medical profession to identify alternative axes of intra-professional engagement and confrontation. At the outset of our period, medicine was organised according to that cliché of medical history - the tripartite legal and hierarchical structure which classified doctors as physicians, surgeons or apothecaries. Each of these pre-industrial status groups possessed its own corporate order which defined appropriate duties, privileges and social rank. At the level of social action, however, corporate affiliation became increasingly less important than the functions medical men performed in everyday practice.(37)

As the pace of capitalist industrialisation and attendant social change gathered momentum, a new professional structure began to emerge out of the old. Hence tripartite internal stratification was gradually undermined and replaced by a bipartite professional

structure of rank-and-file general practitioners on the one hand, and elite consultant surgeons and physicians on the other. The emergence during the eighteenth century of a qualitatively new and distinct kind of practitioner engaging in wide-ranging general practice was a critical structural phenomenon which provided the impetus to the politics of medical reform in the nineteenth century. Radical Benthamite ire, which punctuated the political discourse and activities of men such as Thomas Wakley, was articulated on behalf of the general practitioner denied any corporate voice in the Victorian republic of medicine.(38)

This thesis has also given prominence to another axis of intra-professional conflict characterised in terms of a structural polarity between exponents of the scientific 'word' and the clinical 'ward'. This dichotomy helps to explain the prolonged lack of interface between the clinic and the laboratory, and the persistent stream of scepticism and opposition to the progress of scientific medicine expressed even in the final decades of the nineteenth century by eminent hospital clinicians concerned to preserve their autonomy and cultural hegemony. We have examined first-hand numerous examples of the pedagogy of Victorian medicine - luminous evidence of profound internal tensions and antagonism between medical teachers. This conflict was exacerbated from the 1860s onwards when proselytisers for the cause of experimental medicine and laboratory

procedures began to make headway in British medical schools, and the scientification of medical education grew apace, threatening to subvert traditional clinical authority.(39)

Particular emphasis has been placed on this dimension of internecine conflict between competing occupational sub-groups, because it demonstrates so clearly the existence of powerful countervailing forces which long obtruded even the marriage of science and medicine, not to mention the consummation of the relationship between them. Many previous sociological accounts of the professionalisation of Anglo-American medicine failed to consider, or only weakly elaborated, the significance of clinical suspicion and disdain for scientific disciplines such as experimental physiology.(40) They therefore oversimplified the actual historical relationship assumed between the scientific reform of medicine and the successful accomplishment by doctors of professional status at the end of the Victorian period.

Elucidating the defining parameters and cultural ambience of the clinical phenomenon has been one of the principal concerns and major preoccupations of the thesis. Numerous examples of clinical pedagogy have been examined and found to exhibit many common characteristics conceptualised, in turn, as constitutive of a set of core clinical values. In brief, these comprised: a staunch commitment to actual bedside experience of concrete individual cases as the very

fons et origo of the medical enterprise; a profound suspicion of basing medical judgements on the general principles of physiology, pharmacology, pathology, or even perhaps on the rational reconstruction of prior clinical diagnoses, in preference to the ineffable facts revealed by clinical experience itself; a cultural predilection for regarding clinical judgement as an 'art' in the fullest sense, explicitly insusceptible to formal analysis in terms of probabalistic logic, rational stochastic categorisation, or decision-theory; and an insistence upon the epistemological disjunction between scientific generalisations about disease phenomena and clinical nosography based on concrete experience of the unique causes of the particular diseases of individual patients..(41)

Foucault's profound insights into the epistemic status of the clinical gaze which gave the doctor a privileged perception into the pure uncontaminated 'reality' of disease have broadly received corroboration from the evidence of nineteenth century clinical pedagogy discussed in the thesis. Medical certainty, to adopt the Foucaultian idiom, indeed resided less in completely observed individuality per se than in the completely scanned multiplicity of individual clinical facts.(42) If Foucault is here drawing attention to the espousal by doctors of a 'Weltanschauung' which might perhaps be termed 'systematic philosophical clinicism', then we have discovered its existence in English

hospital medical schools during the nineteenth century. More critically, Foucault's earlier work on the 'Birth of the Clinic' gave insufficient prominence to the socio-economic and political dimensions of this historic phenomenon; he underestimated the explanatory value of seeing clinical culture and clinical pedagogy as goal-oriented.(43) It is also important to recognise that the categories of the 'normal' and the 'pathological' are social constructs rather than inherent within the phenomena themselves. Foucault's later work, which incorporated his meta-analysis of the phenomenon of power, infused more sociological depth into his investigation of the historical evolution of medicine. A slowly-creeping insidious process of 'medicalisation' whereby the body became an object and target of power mechanisms imposing and enforcing social conformity and normalisation became the major focus of Foucault's concern.(44)

Foucault's emphasis on medicine's role in the actualisation and operation of a 'jurisprudence of normalisation' shares much in common with the notion of 'medical police'(45), but the resilience and tenacity of liberal-democratic political orientations in England (the world's first industrial capitalist economy and society) demand caution against uncritically transferring frameworks of interpretation largely applicable to the French and German experience over to alternative contexts. Our conclusion, however, must be

sympathetic to Foucault's 'oeuvre' since we have been groping for tools with which to dissect medical education and culture, and Foucault has provided us with an intellectual stethoscope through which medicine itself might be subjected to the process of auscultation.

Yet clinical medicine, in the last analysis, was only one side of a Janus-faced cultural phenomenon whose other side was science. Even individual scientific disciplines such as physiology or chemistry can seldom be characterised accurately as homogeneous, consensual or monolithic. A community of physiologists or chemists typically consists of diverse fractions, segments or sub-groups who identify with a particular methodological style, set of technical-instrumental imperatives or conception of the scientific enterprise which entails a commitment to biassing future disciplinary development in a particular direction. A modern scientific department securely located within the structure of the universities typically possesses laboratories and an organised academic status hierarchy: this entire figuration is frequently animated by competitive struggle over resources, status and power-chances. Different scientific styles, programmes and specialisms often evolve out of such internal competition within academic institutions. The scientific ideas constructed out of this crucible may be espoused by the relevant community because of their usefulness for determining

the preferred direction of the discipline as well as for their 'truth' value.(46)

The division between the scientific 'word' and the clinical 'ward' identified in the thesis is a far deeper and more formidable opposition embracing wider commitments and goals than the disciplinary fragmentation identified above. The latter pertains perhaps to disputes between anatomical physiologists of the native Hunterian tradition and experimental, physico-chemical reductionist physiologists of the more continental hue; the former pertains to more fundamentally discrepant 'gestalts' or ways of seeing and doing the medical enterprise.

Historians have long been cognisant of tensions and contradictions in the historical shaping of medicine as a corpus of knowledge and practices. The 'scientific' dimensions of medicine have frequently been contrasted with its status as an 'art', and we have observed that this distinction certainly provided nineteenth century medical teachers with a serviceable resource for pedagogical transmission of their cultural predilections in this regard. The dichotomy between medicine as 'art' or 'science' has sometimes been confused with the related but not equivalent issue of medical 'theory' as opposed to 'practice', or even with the distinction between 'physic' and 'surgery' representing 'pure' as opposed to 'applied' medicine respectively.(47) Almost certainly the most inclusive and comprehensive framework

for explaining the historical evolution of medical knowledge has been advanced in Harris Coulter's three-volumed study which attempted to apply the distinction between the antipodean poles of 'empiricism' and 'rationalism' throughout medical history - from the Greeks to the present century.(48)

Earlier, in 1934, Arturo Castiglioni had drawn attention to a significant bifurcation in the development of medical thought which he characterised as "technico-morphological, chiefly analytical" on the one hand, and "cosmical, vitalistic and synthetic" on the other.(49) Among other dualisms potentially applicable to different stages of medicine's historical development may be cited the Kantian distinction between 'idiographic' and 'nomothetic', and a range of more specific antinomies such as 'Platonism' and 'Aristotelianism', 'Lutherism' and 'Pietism', and 'nominalism' and 'realism'.

Coulter's insistence on the viability of a universal structural opposition between empiricism and rationalism undoubtedly represents one of the most ambitious theoretical syntheses ever conceived in the history of medical history itself. The defence mounted in this thesis of an alternative dichotomous framework must be situated in relation to this synthesis.

In brief, Coulter's commitment to explaining medicine's past in terms of "the perennial antagonism between the Empirical and the Rationalist views of

the therapeutic method"(50) fails to do justice to historical complexity. To take but one example mentioned in chapter two, Coulter's characterisation of Hermann Boerhaave - a profoundly synthetic medical thinker who drew upon classical humoralism, Newtonian mechanics, clinical and nosological currents of medical thought - as a quintessential 'rationalist' is inaccurate and misleading. More fundamentally, his thesis is vitiated throughout by an undisguised value-preference for empiricist therapeutics whose apotheosis is identified with Samuel Hahnemann's homeopathy.(51)

Drawing instructively on the sociology of knowledge, Coulter contends that the long-term preference of doctors for rationalist as opposed to empiricist modes of medical thought lies in the former's value as an ideological instrument for professional cohesion and solidarity, serving both a psychological function in creating distance between doctor and patient, and an economic function in facilitating rapid diagnosis and treatment thereby maximising the potential number of patients and therefore doctors' financial remuneration.(52) The critical flaw in this analysis is evident from our thesis: Coulter fails to see that empiricist epistemology has frequently been invoked in support of equivalent professional goals by that large element of the medical community which conceives of itself as clinical.(53)

I therefore wish to suggest that the 'word/ward',

'clinical/scientific' antithesis offers a potentially more subtle intellectual resource for medical historians and sociologists than the contrast between 'empiricism' and 'rationalism', which it often (but not necessarily) incorporates, without prejudicing further investigation or seeking to hypostatise or ontologise the structural dualism in question. The defence of this framework is fundamentally historical, i.e. it is always a matter for empirical investigation whether individual disciplines such as anatomy or physiology are conceived in accordance with the assumptions of the 'word' and the 'ward' in each historical context and period. Some degree of symbiosis, can be envisaged and accommodated within the analytical categories of the framework.

An internally-fragmented Victorian medical profession has been a recurrent subject of this thesis: but if the medical community comprised heterogeneous fragments, it was not necessarily all gallimaufry. On certain critical issues - like the necessity to eliminate all forms of quackery; the dignity and respectability of the medical profession; or the disinterested service performed by doctors pro bono publico - the babel gave way to virtual unanimity. Thus was professional consciousness forged.

The concept of service as a fundamental moral imperative to whose realisation professionals were earnestly dedicated served as a basis on which various fragments of the medical community might sink their differences and express allegiance to a common ideal.

Chapters three and four, in which political strategies of professionalisation were discussed, certainly call into question one well-known historian's construal of the political weakness and lack of social weight of professional groups within English society.(54) It has long been intellectually fashionable to relegate the professions to a peripheral social position, hemmed in by the greater forces of the landed aristocracy and the entrepreneurial middle class, and unable to articulate an independent identity or autonomous ideology.

The 'service'-oriented ideology created and diffused by professionalising groups may have been eclectic in incorporating elements from both the aristocratic and entrepreneurial ideals, but it was nevertheless transformed to fit the needs of rising professional men themselves. The service concept may have provided doctors in particular and the professional classes in general with the social and occupational coherence necessary to form a distinct stratum within the structure of English society.(55)

Rank-and-file bitterly lambasted the medical elite for its aristocratic indifference and unjustified privileges, but reformers did not obliterate the gentlemanly heritage of the professions; they sought rather to appropriate and transform it into a vehicle for elevating their status within the new industrial capitalist society. The complexity of accounting for professional value-orientations stems from the

superimposition of the principally 'occupational' concerns of the modern professional over the 'status' preoccupations of his pre-industrial counterpart.(56) Perhaps this explains the central paradox that 'professionalism' has frequently been presented as an alternative to capitalist economic philosophy and bourgeois political orientations, yet occupational professionalism has been precisely the product of that same economic system and constellation of values.

The Victorian medical profession clearly internalised an intricate amalgam of bourgeois and anti-bourgeois values - profoundly influenced by the middle-class ideology of political economy and favourably disposed to meritocratic principles, competition, efficiency, and the division of labour; yet simultaneously receptive to anti-capitalist attitudes, the aura of a vocational 'calling', aristocratic culture, and hostile to the untrammelled pursuit of profit, greed and self-interest. At the end of the nineteenth century, the profession was largely committed (with important exceptions) to specialisation, competition, and achievement whilst at the same time aggressively cultivating respectability and espousing gentlemanly values: it conformed fully neither to the ideals of the old landed society nor those of the new commercial industrial order. Perhaps the idea of 'service' enabled doctors to reconcile the aristocratic notion of the cultured gentleman with the bourgeois commitment to work and industriousness, and

assisted them in the formidable task of reformulating a definition of their relationship with clients and with the wider society.(57)

The foregoing conclusions are largely the result of having adopted a long-term perspective of comparative historical sociology. In its absence, serious historiographical problems may arise. In chapter two we encountered the 'revisionist' thesis of Holmes that the Augustan period (1680-1730) rather than the epoch of the industrial revolution witnessed the critical transition to a more 'professional'-oriented English society.(58) This challenged the long-held view that the demise of the 'ancien regime' and the onset of 'modernising' processes such as democratisation, occupational differentiation, and industrialisation were critical to the emergence of professional strata within a given social structure.(59)

Holmes' thesis is solidly grounded in extensive empirical evidence and, if true, suggests the iconoclastic conclusion that the socio-economic and political success of the professions in the modern world might prove to be anachronistic. However, the author's rudimentary grasp of the conceptual and historiographical issues surrounding the phenomenon of professionalisation leaves the critical questions - concerning the nature of work and social relations in the transitionary period between pre-industrial and industrial society - unanswered. If Holmes furnishes

impressive empirical evidence of a significant increase in remuneration and social prestige for many 'doctors' (effectively surgeons, apothecaries and surgeon-apothecaries) during the Augustan period, we are entitled to ask what are the historiographical implications of such developments for studies of the changing role of the medical profession within the fabric of English society. If, as Holmes contends, the social and economic gulf between elite physicians and ordinary practitioners had been substantially narrowed by the mid-eighteenth century and the doctor had secured his professional goals, how is one to evaluate the abundant evidence presented in this thesis of embittered and protracted intra-professional conflict between the elite and the rank-and-file throughout much of the nineteenth century?

Admittedly, there may be a risk, as one of Holmes' reviewers observed, of "getting bogged down in the sociological semantic morass of attempting to distinguish a profession proper from a mere occupation or job." (60) However, this thesis seeks to underline an alternative danger - that without conceptual clarification, historiographical depth, and insights drawn from sociological theory, studies such as Holmes' are open to criticism for parochialism and explanatory aporia.

The interpretive parameters of the present study have been sociocentric rather than iatrocetric or

scientific. Prolonged antipathy between physicians and surgeons, and the divorce between medical theory and practice have been explained as long-term products of the circumstance that theoretical knowledge of medicine was for centuries the property of churchmen and clerks, cultivated in the university, and taught in a scholastic and literary manner. The disdain of university- schooled medical literati for manual labour underpinned the enduring mutual suspicion of physicians and surgeons. Similarly, social conflict between regular apothecaries seeking to establish themselves as professional doctors, and a sub-class of chemists and druggists seen by the former as inferior tradesmen, underwrote the long-term separation between pharmacy and general practice.(61)

Just as the thesis has been conceived in accordance with the principles of historical sociology, so it has studiously avoided attributing any kind of epistemological privilege to 'scientific' knowledge. The epistemological status generally accorded to the knowledge produced by bio-medical scientists at the end of our period differed from the conventional view a century earlier - indeed, this change has been a fundamental aspect of the social history of medical education advanced in the thesis. Two authoritative commentators succinctly alluded to the epistemic transformation of the bio-medical sciences at the end of the nineteenth century. Theodore Puschmann, author of the most famous treatise on the history of medical

education, concluded his wide-ranging survey with the observation that "<t>he science of medicine <was> the same in all civilised countries"(62) - a judgement echoed by Merz in another renowned treatise on the history of science who believed in 1896 that "<t>he great problems of science and life <were> everywhere attacked by similar methods."(63)

Such statements clearly raise fundamental questions about the degree of relative autonomy which ought to be conceded to the professionalised science and medicine of the present century.(64) Yet there is no necessity to study science and medicine in accordance with the methodological imperatives held by contemporary positivistic Anglo-American philosophers of science to be constitutive of scientific rationality as such. An encouraging development in recent science studies has been the promulgation of a 'weak' programme which formally eschews any positive identification with the scientific 'Weltanschauung', and refuses to endorse the methodological pronouncements of present-day scientists as exemplary models of objectively correct sociological procedures.(65) As against both the scientistic rhetoric of Bloor(66) and the naturalistic empiricism of Barnes(67), this thesis is emphatically not based on the ultimately a priori assumption that 'science' represents the paradigmatic mode of enquiry. The persistence of naturalistic categories is profoundly indicative of the undersocialised and underpoliticised manner in which

science and medicine continue to be represented in academic discourse.(68)

Finally, is there any relevance or connection between our historical sociology of Victorian medical education and present-day circumstances? Both the division between pharmacy and general medicine, and the suspicion between 'scientists' and 'clinicians' are still manifest and observable in contemporary Britain.(69) The publication in May 1986 of a BMA Report almost uniformly hostile to a range of alternative forms of healing and contemptuous of most alternative practitioners also suggests that our analysis of the aggressive repudiation of 'quackery' in the Victorian period as a critical element of professionalisation cannot readily be construed as entirely anachronistic in the present context.(70)

Of course, many significant changes - most obviously the advent of the NHS - have taken place in the British medical world during the present century. Some commentators have announced the 'rediscovery' of the patient after his 'disappearance' (with the arrival and maturation of scientific laboratory medicine) in the previous century.(71) Others have discerned in the dynamics of socio-medical change a trend towards 'de-professionalisation' as state direction of resources increasingly undermines the traditional autonomy of the medical community.(72) While it is legitimate to ask why (if patient power is growing and professional obstacles to progressive reform have been removed by explicit

rationing of resources by the state) widely-recognised structural contradictions within the NHS have failed to be resolved, such arguments underline the fundamental importance of adopting an historical perspective in order to advance our understanding of these issues. For this reason, the thesis has not sought to delineate a range of abstract qualities or characteristics which define the nature of professionalism in general, but to examine the historical circumstances in which occupational groups put forward claims about the status of their labour and to demonstrate the means by which the group in question advanced its social, economic and political goals in a particular context.

Over the last decade or so, the history of science and medicine has undoubtedly made advances on a number of fronts and gained intellectual weight to the extent that historians have incorporated insights from other disciplines such as anthropology and sociology.(73) Yet as recently as 1983 Charles Webster concluded a broad survey of the historiography of medicine with the observation that there was "little sign of historians of medicine abandoning their traditional preoccupation with great doctors and great books."(74) Unfortunately, it cannot be claimed that this conventional predilection has receded very much in the subsequent three years. Leading luminaries among the 'profession' of the history of science and medicine continue to voice the historian's traditional aversion to theory and analysis.

A.Rupert-Hall, for example, recently opined that "a return to narrative history <was> long overdue"(75), but biographical compilation and one-dimensional narrative have continually hampered the discipline. Only through the development of more refined analytical categories with which to explain the past will historians genuinely illumine the implications and consequences of the Baconian maxim (which effectively set the agenda for the historian of modern science and medicine, and which has been the ultimate theme of the foregoing thesis):

Scientia et potentia humanum in idem coincident.